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Heavy Pig Iron Buying

Improved Sentiment in Finished Iron and Steel

The feature of the week has been the beginning of what promises to be a heavy buying movement in pig iron. It began with the purchase by a large plow company at South Bend, Ind., of more than 40,000 tons of pig iron, comprising foundry, malleable Bessemer, high silicon and charcoal iron. The charcoal purchased comprised 12,000 to 15,000 tons, the malleable 10,000 tons, the Southern 8000 tons, and included in the remainder was about 8000 tons of Northern off-grade foundry iron. Some of this purchase was for early delivery, while on part of it the shipments will run over the first eight months of next year. While slight concessions are stated to have been made on the iron for early delivery, a better price than current quotations was secured by the sellers for deliveries running into next year.

This transaction has brought out much inquiry from other large pig iron consumers who have become convinced that it may be well to follow the example thus set. The Chicago district has inquiries for fully 50,000 tons of Northern and more than 30,000 tons of Southern, for delivery running through the first quarter and half. Pig iron sellers both East and West have an inquiry from a large manufacturer of soil pipe for 15,000 to 30,000 tons for its various foundries located in several States. Pittsburgh further reports large inquiries for foundry, Bessemer, basic and malleable Bessemer. More activity is noted in Buffalo, where good sales have been made, while a radiator company is asking for 6000 to 10,000 tons of foundry iron and a number of inquiries are in hand for iron for the first half of next year. At Cleveland both inquiries and sales show much improvement, purchases having been made by Michigan stove manufacturers. A St. Louis steel foundry is asking for prices on 10,000 tons of basic, half for next year's delivery.

The improved sentiment noted last week continues as to finished iron and steel. Specifications continue heavy in all lines and good inquiries are beginning to appear. A large consumer is in the market for 10,000 tons of steel bars for shipments running over a year and other steel bar inquiries may run the total quantity now in the market to 25,000 tons or more. The sheet and tin plate mills are negotiating for round tonnages of sheet and tin plate bars and some of this business has already been closed. One large independent

tin plate company has contracted with three mills for its requirements running over two and a half to five years, the settlements to be based on current market quotations. The American Sheet & Tin Plate Company has not yet decided to start up its three tin plate plants which were kept idle on account of the strike that was declared off last week, but it may be found necessary to do so in the near future for the purpose of supplying the heavy demand for tin plate. Chicago reports a large business in prospect in structural material. The plans for the new Union Depot alone in that city call for 75,000 to 100,000 tons. It is now regarded as extremely probable that September will show orders for finished iron and steel exceeding the deliveries.

The rail sales of the week comprise 9000 tons of ferrotitanium Bessemer rails sold to the Chicago, Milwaukee & St. Paul Railroad by the Lackawanna Steel Company, 3200 tons to local buyers by the Illinois Steel Company and 7000 tons to the Korean Railway by the United States Steel Products Company. Inquiries are in hand for a considerable quantity of rails from domestic roads, including one for 14,000 tons and one for 13,000 tons.

Pig tin has been soaring the past week. On Friday, due to London speculation, spot tin sold in New York at 36c. per pound, which is the highest price reached since August, 1907, when it sold at 36.12½c.

Workmen's Compensation and Pension Systems

Two essential questions which must be answered by an industrial company in establishing a workmen's compensation and pension system are: Shall employees contribute to the fund from their wages? Shall there be restrictions in the distribution of the benefits, including payment for injuries sustained during employment? These subjects bear a close relation to each other, and a conflict of purpose may follow an unskillful adjustment, even to the point of widening instead of narrowing the gap between employer and employees. A difference in practice must exist, comparing a system of which the total expense is borne by the owner with one where employees contribute a percentage of their wages, even though the amount collected from the latter source be relatively small. The workman procures a right to the benefits either by the terms of the contract of his employment or by the act of his own payments. The degree of the employer's obligation varies somewhat according to the financial conditions surrounding the system.

The comprehensive and farsighted plan of Cheney Bros., South Manchester, Conn., published in detail in another portion of this issue, affords an excellent basis of thought in considering the general question. Stated briefly, the employee of the firm who becomes a member of an association of his fellows (and none other is eligible), to which he contributes a part of his earnings, is entitled to sick and accident benefits, insurance against death from either cause, an annuity after long years of service, and, at the firm's discretion, a pension. All benefits but the last one are his right, provided he lives up to certain rules in his employment, and, as it affects sickness, to certain rules of private life. His own contributions to the fund are applied only to sick benefits and annuities, and for this purpose are duplicated by the firm, whose own guaranteed responsibilities are relatively large. The owners, however, determine the rules governing compensation in its several forms. For example, concerning accidents, an employee cannot expect to receive payment if his injuries are the result of "willful and gross carelessness or disobedience to rules reasonably designed for the protection of employees." In this connection it should not be lost sight of that the firm pays all accident claims from its own treasury.

Much can be said for a system of assessment of employees in connection with compensation. It need not be compulsory; a workman may decline to enter into the plan, but by so doing he fails to establish the right to participate in its benefits. The system must have its rules and restrictions, based upon length of employment and other factors, among them, perhaps, a regulation such as that quoted from Cheney Bros. The argument has been raised that where a workman contributes from his wages benefits should be paid him regardless of the circumstances of the case. The presumption is that the man voluntarily enters into an agreement to devote a portion of his wages to this purpose, with the idea of protecting his family as well as himself. It may be his substitute for another form of insurance. On this theory his dependents may be considered as contributing a certain share of the monthly assessment and, without fault of their own, must be losers should their breadwinner suffer injuries or death as a consequence of violating the rules of his employment. As to the additional expense which a freedom from restrictions would entail, the contention is that all of the employer's part of the obligation is figured into industrial costs and as such is borne by the consumer, and a slight addition to the burden would not be felt—a statement hardly to be accepted in some lines of trade where competition is close.

Probably the real secret of a successful compensation system is one of management rather than of restrictions or their absence. Rules such as these are made to be broken by discriminating directors. Provision must be made against imposition, as will be realized by those familiar with the *personnel* of great numbers of the workmen in American mills and factories. The successful system is operated to bring closer the owners and the people whom they employ. Manufacturers realize keenly that their workmen are suspicious of any plan which is represented to be based on humanity and generosity, because they credit the employer with no other motive than a wish to make money. Many of them see in compensation a means of reducing employers' liability charges, when, as a matter of fact, the cost of accidents is increased, sometimes materially. The employee still has the same recourse to the law that he has always enjoyed. He has something besides, in a source of compensation for which the laws of most States make no provision for him. Understanding those with whom he is dealing, the manager of the compensation system must be a law unto himself in his right to ignore rules should the individual case require it. This is fair to all—in systems where employees do not contribute, for they are getting something for nothing anyway; where they do contribute, justice may demand that the assessments of the sober, industrious workman shall not be used as payment for injuries to one whose habits have rendered him grossly or wilfully negligent.

A Labor Decision Which Explores New Ground

Supreme Court Justice John W. Goff of New York handed down an opinion August 27 which opens up a new phase of the controversy over the closed shop. An application having been made to him for an injunction to restrain what is known as peaceful picketing in the strike of the New York City cloak makers, he decided that this strike was in effect a conspiracy in restraint of trade. He based his decision on the precedent of the New York Court of Appeals in the case of McCord against the Thompson-Starrett Company, in which that court declared that it is against the public policy of the State for employers to control practically the whole trade in a community and to combine for the purpose of compelling workmen to join a particular union as a condition of employment. Judge Goff says:

> If the rule laid down in the McCord case be the law, and it must be accepted as such, being the latest expression of the Court of Appeals, it must be applicable to workmen as well as to employers. It would be repugnant to reason to hold that it applies to one and not to the other. What the employers may not do the workmen may not do. If a combination of one to refuse employment, except on condition of joining a union, be against public policy, a combination of the others to cause refusal of employment, except on condition of joining a union, is alike against public policy.

The strike of the cloakmakers was begun for the purpose of forcing a closed shop agreement and also to secure shorter hours and higher pay. The court, however, holds that the primary object of the strike is to deprive other men than the strikers of their opportunity to work and drive them from the industry.

This decision is regarded as exceedingly important, as it will apply not only to the present strike but to any other strike where an attempt is made to enforce a demand for the closed shop. The labor unions will, of course, carry the case to a higher court, but the principle laid down appears to be difficult to overthrow.

Steel Balls and Their Manufacture

Recently in these columns attention was directed to some of the methods of manufacturing ball bearings. The production of an approximately perfect steel ball is becoming an almost vital matter, because of the considerable introduction of ball bearings which has already taken place and the much wider use which is reasonably to be expected. As to just what really constitutes an approximately perfect ball not every one is aware.

The application of ball bearings to bicycles in the latter part of the nineteenth century is undoubtedly largely responsible for their present known importance. It is also indirectly responsible for a certain amount of lack of confidence still persistent among the builders of machines and other apparatus. In the bicycle the load is small and the velocity inconsiderable. Thus, 200 lb. may be taken as the load; and the angular velocity of a bicycle wheel going at the rate of about 60 miles an hour is only 720 rev. per min. Under such favorable conditions of speed and load, ball races of imperfect design and balls of equally imperfect manufacture were entirely satisfactory, but when the attempt was made to deal with really severe conditions it was met with failure. It is now known that both designer and manufacturer were at fault. The designer did not know how the races should be formed; the manufacturer did not know the grade of perfection that was essential in both ball and raceway.

The proper design of the ball is obvious. It should be a perfect sphere. However, probably no one has yet made a perfectly spherical steel ball. The practical question then is, Within what limits must the imperfections lie? Ideas as to this have changed until now a ball of the highest quality must be perfect within 0.0001 in. This requirement comes largely because of the effort to eliminate play in the modern bearing. Radial clearance should be as nearly nothing as possible, which it cannot be if the balls are not of the same size, or if they are not perfectly round. It is impossible to make radial clearance negligible with the use of balls having any appreciable variation in size from one another or of balls deviating in any but the most minute way from perfect roundness.

It seems quite probable that when a ball passes under maximum load it is called upon to take nearly the whole of the load imposed upon the bearing itself. This load comes on with great rapidity, though by degrees; and passes off in the same way. It is imposed upon a minute surface, which is not provided with support of other metal from all sides. The ball must, therefore, be both hard and tough. There is a tendency to flake, and only special steels are able to furnish the qualities necessary. In other words, the steel ball of highest quality to-day is a ball which could not have been manufactured a few years ago, because of the want of a suitable material. The exact treatment necessary to give the best results has had to be sought also. Perhaps the best present practice is to make the ball of exactly the same degree of hardness as the raceways, all being made of the same steel; or to make the balls slightly harder, the chrome steel in the balls being of a somewhat higher carbon content than that in the raceways.

To-day the manufacture has been carried to such a point of perfection and the material is of such marvelous excellence that the performance of the highest grade of ball when associated with raceways of the best design and manufacture is but little short of wonderful. As builders of apparatus become alive to the possibilities, the application of balls and their raceways will rapidly extend.

Workmen's Compensation in Illinois

The Employers' Liability Commission of Illinois, established under the act of the last Legislature, to investigate the problem of industrial accidents and to prepare a bill for accomplishing a system of compensation for losses, has issued a statement of the plan which it will recommend for enactment into law. It is workmen's compensation, similar in general respects to the system already established in New York and in various European countries, but contains a highly interesting method of inducing both employers and employees to use this method of adjusting damages instead of resorting to the common law. The plan follows:

> To make the law compulsory in form, but elective in fact, providing in the first instance that the employer shall pay the compensation, according to the scale set forth in the act, but reserving to both employer and employee their common law remedies, including trial by jury, providing, however, as to the employer that if he refuses to pay the compensation according to the scale provided, and forces the employee to his action at the common law, he shall not escape liability by reason of either (1) the fellow servant rule, (2) the assumption of the risk, or (3) the contributory negligence of the employee, unless his negligence be greater than that of the employer, in which event the damages shall be apportioned according to the relative degree of negligence, and the burden of proof shall be upon the em-

ployer; and providing as to the employee that he shall be presumed to have accepted the compensation law, and any acceptance by him of compensation under the proposed law, except necessary medical and surgical attention, shall bar the right of action at common law, and the beginning of any action at law shall bar his right to compensation under the proposed law, except in the case of willful negligence of the employer or his failure to comply with statutory or municipal safety regulations; these two limitations upon the rights of the respective parties being imposed for the purpose of inducing them both to accept the compensation law, and to refrain from using the present unsatisfactory methods of settling claims for personal injury.

To reduce the statement to a few words, the employer who declines to accept the compensation law in the adjusting of an accident case would be deprived of his three chief defenses under the employers' liability act, while, on the other hand, these defenses—that of the fellow servant, the assumption of risk and contributory negligence—would be at his disposal should it be the employee who selects the alternative. Under the New York law owners of industrial works are deprived completely of these cardinal features of employers' liability. Therefore in Illinois the employer would be proportionately better off, for the old rights would be reserved to him should he be willing to accept the provisions of workmen's compensation.

The scale of compensation recommended is not unusual. In cases of death where there are dependents, three years' wages are provided, but not less than $1500 nor more than $3000. Where there are no dependents the sum shall not exceed $200. For permanent disability a pension is established on the basis of 50 per cent. of the earnings of the employee, to be paid as long as disability lasts or until the compensation equals the amount of four years' wages. Where the disability is permanent, but only partial, the percentage of compensation or pension is reduced in proportion to the reduction in earning capacity. For temporary disability the basis is 50 per cent. of the earnings. For the permanent disability of minors the basis is 50 per cent. of the earnings of adults in the same line of employment.

The proposed law would apply to all employers of labor who have more than five persons employed at one time. The limit is a low one. The risk of the small employer, while proportionately the same as that of large works, is far greater in practice, for, while the chances are more in his favor, ill fortune in the way of a serious accident would mean in many cases a crippling loss.

It is interesting to note that neither Chicago employers nor labor leaders are pleased with the provisions of this proposed law. The employers object to the scale of compensation as being too high, while the labor representatives assert that what they first desire is an employers' liability law and they are not willing to consider at present compensation for injuries.

The High Cost of Living.—Secretary James L. Barton of the American Board of Commissioners for Foreign Missions, Boston, Mass., is given as authority for the statement that the problem of greatly increased cost of living is as acute to-day in Asia Minor, Armenia, Syria, Macedonia, India, Ceylon, China and Japan as it is in the United States. The problem has become a serious one with the board in view of its maintenance of some 600 missionaries, 4500 native preachers, teachers and assistants, and over 70,000 pupils in schools. Secretary Barton draws the conclusions that the rise of prices in the United States is not due to local conditions alone, since all parts of Asia, Africa and portions of the Pacific are affected alike.

The Western Steel Corporation

The *Pacific Builder and Engineer*, in its issue of August 6, gives an interesting illustrated description of the steel plant of the Western Steel Corporation at Irondale, Wash. The description, in addition to giving details which have already been laid before our readers, makes some further interesting statements. The fact is mentioned that a special bonded yard has been provided for the Chinese pig iron imported for the use of the steel plant. It is stated that "this feature is a financial gain to the corporation, as a large shipment of pig iron may be received from China at no investment to the American manufacturers, who take the pig out of bond as it is needed and pay for it as used." The blast furnace at Irondale is now being operated on a mixture of Chinese and Snohomish County ore, from which a high grade pig iron is obtained containing about 4 per cent. graphitic carbon, from 0.013 to 0.040 sulphur, 0.41 to 0.49 phosphorus, 0.08 manganese and from 0.99 to 2.68 silicon. The cost of production of the pig iron is given as follows:

Iron ore	$5.92
Labor cost	2.50
Coke	4.75
Limestone	0.66
Total	$13.83

It is stated that 1900 pounds of coke is used per ton of pig iron. Information comes from Pittsburgh that the corporation has given an order to the Lewis Foundry & Machine Company for a 9-in. bar mill. This will be three high, having one stand two high and one stand with two sets of pinions, making four stands in all. It will be used for making small bars and structural shapes, and is to be placed back of the 14-in. mill in the plant at Irondale. The 14-in. mill will, therefore, be used for rolling the heavier sizes of bars and shapes and will also turn out light rails.

Opening of the Pennsylvania Railroad Station in New York City

The Pennsylvania Railroad Company announces that its new station in New York City, which covers the entire area bounded by Seventh and Eighth avenues and Thirty-first and Thirty-third streets, will be opened September 8 for service between New York City and points on the Long Island Railroad. No definite date has been set for the inauguration of service from points west of New York City. This is the largest building in the world ever built at one time. An official booklet has been issued by the company, entitled "The New York Improvement and Tunnel Extension of the Pennsylvania Railroad," which contains 23 photographic reproductions illustrating both the interior and exterior, as well as giving views of the tunnels, the interior of one of the tubes and a picture of the Pennsylvania type electric locomotive. The construction of the tunnel extension was begun June 10, 1903; the tubes of the tunnel under the Hudson River were joined October 9, 1906, and those under the East River March 18, 1908, being the first tunnels for standard railroad trains constructed under these rivers. The construction of the New York station building was begun May 1, 1904.

At a meeting of stockholders of the Youngstown Foundry & Machine Company, Youngstown, Ohio, held last week, the following Board of Directors was elected: W. J. Wallis, F. A. Williams, B. G. Parker, S. K. Hine, A. E. Adams, H. A. Parrock and Emanuel Hartzell. The following officers were elected: W. J. Wallis, president and general manager; Frank A. Williams, vice-president and manager of sales, and B. G. Parker, secretary and treasurer.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.31, 1910.	Aug.24, 1910.	July27, 1910.	Aug.25, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.25
Foundry No. 2, Southern, Cincinnati	*14.25*	14.25	14.75	16.75
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.50
Basic, delivered, eastern Pa.	*15.00*	15.00	15.50	17.50
Basic, Valley furnace	*14.00*	14.00	14.50	15.25
Bessemer, Pittsburgh	*15.90*	15.90	16.40	17.40
Gray forge, Pittsburgh	*14.15*	14.15	14.40	15.65
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	24.50
Forging billets, Pittsburgh	*29.00*	29.50	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	27.50	28.50	27.00
Wire rods, Pittsburgh	*28.00*	28.00	29.00	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**13.50**	13.50	13.90	16.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	17.00
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	19.75
Car wheels, Chicago	*14.00*	14.50	14.75	17.00
Car wheels, Philadelphia	*13.75*	13.75	14.00	16.00
Heavy steel scrap, Pittsburgh	**14.25**	14.25	14.00	16.75
Heavy steel scrap, Chicago	12.25	12.25	12.25	15.50
Heavy steel scrap, Philadelphia	*13.75*	13.75	14.00	17.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.47
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.40
Common iron bars, Pittsburgh	*1.45*	1.45	1.50	1.50
Steel bars, tidewater, New York	*1.56*	1.56	1.61	1.51
Steel bars, Pittsburgh	*1.40*	1.40	1.45	1.35
Tank plates, tidewater, New York	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh	*1.45*	1.45	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.55*	1.55	1.60	1.50
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.20	2.25	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.65*	1.65	1.70	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.87½**	13.00	12.62½	13.50
Electrolytic copper, New York	**12.62½**	12.62½	12.50	13.25
Spelter, New York	**5.35**	5.35	5.20	5.85
Spelter, St. Louis	**5.20**	5.20	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	**4.30**	4.30	4.25	4.32½
Tin, New York	**35.70**	34.50	33.25	30.45
Antimony, Hallett, New York	7.87½	7.87½	8.00	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Ganges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c.; Nos. 15 and 16, 1.90c. Box annealed sheets: Nos. 17 and 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c. to 2.15c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.60 per square. Galvanized roofing sheets, No. 28, $2.95 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ⅝-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, August 31, 1910.—(*By Telegraph.*)

Pig Iron.—There are heavy inquiries for foundry and steel making iron in the market, and it is probable that a good deal of tonnage will be closed up within a short time. While the market is not higher, prices are firmer, and it is now believed that bottom has been reached. We quote Bessemer iron at $15 to $15.25; basic, $14; No. 2 foundry, $14; gray forge, $13.25 to $13.35, and malleable Bessemer, $14.50, all Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—Makers of sheets and tin plates who buy their bars in the open market have been quite active with inquiries lately and considerable tonnage is under negotiation. It is believed that prices on steel have about reached bottom and consumers are naturally anxious to cover as far ahead as possible at present prices. We quote Bessemer billets at $24.50; Bessemer sheet bars, $25.50; open hearth billets, $25.50 to $26; open hearth sheet bars, $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

Tin Plate.—The American Sheet & Tin Plate Company is operating at present 197 hot tin mills out of a total of 235, or 84 per cent. of its capacity. The New Castle Works, containing 20 hot mills; the Sharon Works, 20, and the Shenango Works, 30, are all in operation to full capacity, and were before the tin plate strike was declared off. The company is operating 78 per cent. of its sheet mill capacity, and has made no definite plans as yet regarding the starting of the Laughlin and La Belle mills in the Wheeling district and the Aetna-Standard at Bridgeport, Ohio, these three plants having been closed down for 14 months.

(*By Mail.*)

The stronger tone in the iron market referred to in this report last week continues, and there is no doubt whatever but that the whole situation is showing more strength and there is a more optimistic feeling regarding the future than for some time. Prices of pig iron, steel and on nearly all kinds of finished material have reached such a low point that large consumers are now interested in the market and some heavy inquiries for material for forward delivery are in the market. It is argued that with Bessemer iron at $15 or lower, basic below $14, steel billets about $24.50 and sheet bars slightly higher there is an incentive for large consumers to take hold and make contracts. The purchases of pig iron by the Oliver Chilled Plow Works of South Bend, Ind., are put at all the way from 40,000 to 50,000 tons, but as near as can be learned from reliable sources this concern has bought about 26,000 tons of pig iron, mostly for delivery next year and at very low prices. One interest is reported to have taken 10,000 to 12,000 tons of malleable Bessemer and 4000 to 5000 tons of another grade, while a second interest is said to have taken nearly 10,000 tons of Southern iron, while a small tonnage of malleable Bessemer went to a Cleveland interest. None of the prices paid for this iron has been made public or given out by the buyer, but it is known that the prices were attractive to the purchaser and possibly could not be duplicated to-day. There are other large inquiries in the market for Bessemer, basic, foundry and malleable Bessemer iron, and it is probable within the next week or two some further round lots will be closed. The Valley merchant furnaces object to selling iron for forward delivery at present low prices, asking from 50c. to $1 a ton advance where the deliveries on the iron run into next year. A number of the large independent sheet and tin plate mills are in the market for round tonnages of sheet and tin bars, and considerable business has already been closed. One leading independent tin plate plant has bought a heavy tonnage of tin bars, divided among three concerns, prices to be based on quotations in the market reports in *The Iron Age* and running over a period of two and one half to five years. Specifications against contracts in August in nearly all lines of finished iron and steel were much heavier than in July, and it is believed that September will show an increase over this month. The rod, wire and nail mills of the Pittsburgh Steel Company, which have been idle for two weeks or more, started up in full on Monday, August 29. This concern is the largest consumer of heavy steel scrap in the Pittsburgh district, and the fact that its plants have started up again has already created a better feeling in the scrap market. Specifications on contracts for wire and wire nails in August were heavier than in July, and the leading makers have considerable business ahead. Reports that the Youngstown Sheet & Tube Company would start at once erecting an open hearth steel plant at East Youngstown, Ohio, are premature. This concern will probably build during 1911 an open hearth plant at East Youngstown, to contain about six 50-ton furnaces, with a capacity of about 600 tons per day. The concern states that it needs a certain amount of open hearth steel for its finishing departments. Summed up as a whole, the market is better and still further improvement in September is expected. Prices are showing a firmer tone, and some low quotations on inquiries sent out two or three weeks ago have been withdrawn. Stocks of finished iron and steel held by jobbers are lighter than at any time during this year, and this is shown by the fact that in many cases orders sent to the mills carry with them urgent requests for prompt shipments. This is particularly true of the heavy stocks of pipe and wire products, which we are advised have been pretty well worked off.

Rods.—The increase in specifications in wire products in August has brought about a better inquiry for rods, most of which, however, is for small lots for nearby needs. We continue to quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at $28.50 to $29, Pittsburgh. A sale of 500 tons of rods for chain purposes is reported at $28.60, at mill.

Skelp.—A number of puddling plants in the Central West are still idle on account of no agreement having been reached on the puddling scale with the Sons of Vulcan. For this reason several makers of iron plates are asking higher prices, and a sale of 1500 tons of wide iron plates is reported on the basis of about 1.92½c., maker's mill. We quote: Grooved steel skelp, 1.45c. to 1.50c.; sheared steel skelp, 1.55c. to 1.60c.; grooved iron skelp, 1.80c. to 1.85c., and sheared iron skelp, 1.90c. to 1.95c., Pittsburgh.

Ferromanganese.—One or two small inquiries have been up in the past week and prices seem to be a shade firmer. Several of the large importers are holding 80 per cent. foreign ferro at $39.50, Baltimore, and do not seem inclined to shade that price. We quote foreign 80 per cent. at $39 to $39.50, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—There is little or no new inquiry for this material, most consumers being covered for remainder of this year. Present prices of ferrosilicon are regarded as very low, and brokers who handle this material are urging their clients to take hold. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh, and blast furnace ferrosilicon as follows: $23 for 10 per cent., $24 for 11 per cent. and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Muck Bar.—There has been some inquiry in the market for muck bar, and, owing to its scarcity, higher prices are being quoted, as high as $29 to $30 being asked by makers of muck bar that can ship promptly.

Steel Rails.—Coal mining and lumber concerns continue to place new orders freely for light rails, the Carnegie Steel Company having booked a larger tonnage in August than in July, last week's new sales and specifications having been particularly heavy. There is not much new inquiry for standard sections, only a very few small orders having been booked. The three Edgar-Thomson rail mills of the Carnegie Steel Company, at Bessemer, are operating to about 60 per cent. of capacity, and have a fair amount of work ahead. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—The American Bridge Company has taken a contract for about 12,000 tons of steel for a building in New York City and has also taken 4000 to 5000 tons of bridge work for Western roads. A new union depot in Chicago is being figured on, and if this goes through it is estimated that it will take at least 75,000 tons. The McClintic-Marshall Construction Company has taken several fairly large contracts in the past week and is now fabricating at its Rankin, Pa., shops the material for the Panama lock gates. Tonnage booked by the structural interests was heavier than in July, and the American Bridge Company will show a handsome increase this month over last month. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., Pittsburgh. It is stated that on several inquiries for delivery at competitive points the lower price has been slightly shaded.

Plates.—Nothing has been done as yet with the inquiry of the Chicago & Alton for 3000 steel cars, and the opinion is that this order may not be placed. The local steel car companies have about enough work on their books to keep them moderately busy up to November 1, but after that have practically nothing. No contracts of moment for steel cars have been placed for two or three weeks, and no new inquiries are reported. Some of the leading plate mills have very little work on their books, and are able to ship out plates within two or three days after the order is received. We quote ¼-in. and heavier plates at 1.40c. in large lots and 1.45c. in small lots. It is stated that several of the

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smaller plate mills that make only a limited range of sizes are offering narrow plates at 1.35c., at mill.

Sheets.—New inquiry for sheets is better than for some time and considerable business has been placed for delivery over this year, this being due largely to the low prices that are ruling. No. 28 box annealed one-pass black sheets are being offered for delivery over remainder of this year at 2.15c. to 2.20c., at mill, and No. 28 galvanized at 3.20c. to 3.25c., at mill. On galvanized and painted roofing material prices are being shaded $2 to $3 a ton. Prices on sheets printed on a previous page about represent the general market, but for a very desirable specification could probably be slightly shaded. The American Sheet & Tin Plate Company has started up its sheet mill at Struthers, Ohio, containing six hot mills, and which has been shut down for about three weeks for repairs. Box annealed black sheets are on a basis of 2.20c. for No. 28, while No. 28 galvanized are about 3.25c., at mill, in carload and larger lots. On painted and galvanized roofing material prices are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—As yet the calling off of the strike in the mills of the American Sheet & Tin Plate Company has not resulted in the starting up of the Laughlin and La Belle tin mills in the Wheeling district, which have been closed for about 14 months, and the present plans of the company regarding these two plants have not been announced. There is much activity among the tin plate mills, which are running full on specifications against contracts and against which they are somewhat behind on shipments. Tin plate for prompt shipment is reported as scarce, and it is stated that recently premiums of 5c. to 10c. a box have been paid for prompt shipment. Prices are firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—New orders for both iron and steel bars being placed at present are light, but the mills rolling steel bars are receiving specifications freely against contracts from the wagon and implement builders, and shipments are moderately heavy. No settlement on the puddling and muck bar scale has yet been reached with the Sons of Vulcan, and as a result a number of puddling plants in the Central West are still idle. The mills rolling iron bars have only a fair amount of business on their books and new orders are not being placed very freely. We continue to quote steel bars at 1.40c. in large lots and 1.45c. in small lots, while iron bars are 1.45c. to 1.50c., f.o.b. Pittsburgh, prices depending on the nature of the order.

Spelter.—The market is showing more life than for some time, inquiries being better and prices firm and higher. We quote prime grades of Western spelter at 5.22½c. to 5.25c., East St. Louis, the freight to Pittsburgh being 12½c. per 100 lb.

Hoops and Bands.—Consumers are specifying at a fairly satisfactory rate against their contracts and shipments by the mills in August on actual orders were heavier than in July. We continue to quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card.

Spikes.—No orders of moment for railroad spikes have been placed in the past week and makers of these are only fairly busy. Demand for spikes from the railroads all this year has been of a hand to mouth nature, in spite of the low prices that have been ruling for some time past. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—A fair amount of new business is being placed, but new orders are mostly for small lots to cover actual needs. Official prices on boiler rivets are 2.25c. and on structural rivets 2.15c., f.o.b. Pittsburgh, but these prices have been shaded by the makers for some time.

Shafting.—Specifications against contracts for shafting are coming in at a fairly satisfactory rate, but new demand from automobile makers and other consumers is not nearly so heavy as it was some time ago. Regular discounts on shafting remain at 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Specifications against contracts for wire products in August were heavier than in July, and September promises to show a still further increase over this month. The Pittsburgh Steel Company has started up its rod, wire and wire nail mills at Monessen, Pa., after being shut down about three weeks. This concern is having a particularly heavy demand for its electrically welded fences. There is a fair demand for cut nails, but mostly in small lots to cover urgent needs. It is stated that prices on wire products are being maintained, with the exception of the Southern district, several of the mills along the Ohio River in that district continuing to shade regular prices slightly.

Merchant Pipe.—In addition to contracts for about 75 miles of 4-in. to 8-in. pipe placed lately by the Texas Company, and about 35 miles of 10-in. to 16-in. by the Ohio Fuel Supply Company, the inquiry of the Busch-Everett Syndicate, which proposes to pump natural gas into St. Louis, is again active. This inquiry calls for 320 miles of 20 x ⅜ in. pipe and 135 miles of 20 x 5-16 in. pipe. It is said the Arkansas Natural Gas Company, in which a large number of Pittsburgh people are interested, has arranged for laying a gas line from the Louisiana fields to Little Rock, Ark. The line will be 235 miles long and will be laid with 10, 12, 16 and 18 in. pipe. The Manufacturers' Light & Heat Company, a local gas interest, is in the market for 23 miles of 16-in. pipe, and the Monongahela Natural Gas Company, also a local interest, is inquiring for about 8 miles of 10-in. I. D. pipe and about 6000 ft. of 12-in. O. D. pipe. On the larger sizes of pipe the mills are pretty well filled up for the next two or three months, and new demand for butt weld sizes is reported to be better than for some time. It is stated that regular discounts on iron and steel pipe, printed on a previous page, are being better maintained than for some time.

Boiler Tubes.—Demand for boiler tubes from the railroads has been light for some time, while the boiler shops have been placing orders only to meet current needs. It is believed that demand for both locomotive and merchant tubes will show betterment in the near future. Regular discounts on tubes, printed on a previous page, are still more or less shaded.

Coke.—The Isabella-Connellsville Coke Company, which has had a large cokeworks under construction at Rice's Landing, Pa., started up 75 new ovens last week, and will blow in more in the near future. It has finished 300 ovens at this place and 400 more are being built, all of the beehive type. This company took a very large contract for furnace coke for the new blast furnaces of the Jones & Laughlin Steel Company, at Aliquippa, Pa., and probably the entire output of the plant for some time will be shipped to that consumer. No large inquiries are in the market for furnace or foundry coke, most consumers having covered their requirements for the remainder of this year, but several large blast furnace interests continue buying coke from month to month.

Iron and Steel Scrap.—It is probable that before this week is out the embargo on scrap routed for Monessen, Pa., will be lifted, as the rod and wire mills at that place, which have been idle for about three weeks, were started up on Monday, August 29. New demand for scrap is better than for some time, and more material is moving from the dealers to consumers. Prices are also a shade firmer and some low quotations on scrap recently sent out by dealers have been withdrawn. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburg delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.25 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	11.50 to 11.75
Low phosphorus melting stock	17.50 to 18.00
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.75 to 8.00
Machine shop turnings	9.25 to 9.50

There is a good demand for cast iron borings, and sales of 700 to 800 tons were made, for spot shipment, at $7.85 to $8, Pittsburgh. Other sales include about 1500 tons of heavy steel scrap at $14.50, delivered; 1200 to 1500 tons of bundled sheet scrap at $12.15, delivered, equal to about $10.50 at shipping point; 50 tons of low phosphorus melting stock, running 0.04 per cent. and under, at $18, Pittsburgh, and about 250 tons of No. 1 busheling scrap at about $12.25, Pittsburgh.

Chicago

FISHER BUILDING, September 1, 1910.—(*By Telegraph.*)

In spite of the slack business conditions, Western shippers are complaining of delays in obtaining cars. The shortage of cars has not become serious, and is due to the practice of Western railroads of sending all their box cars to the country at this season for the first loading of grain. A severe car shortage is generally expected by shippers during

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the coming winter, however, as crops are large and the railroads have less equipment than two or three years ago. Any material expansion in the volume of business will be limited by the facilities of the railroads, which will not be equal to the movement of any very large tonnage. At present the iron and steel industry in the West is holding about an even keel. The more active lines, such as steel bars, merchant steel and wire products, strike an average with bar iron, plates and other lines in which business is not so good. The volume of sales in wire products is better than a year ago, and all manufacturing lines which depend on agricultural conditions are doing well. There is a good demand for moderate sized lots of sheets, and buying of merchant mill products from store continues very satisfactory in the number of orders received. Large consumers of copper in this territory have been buying liberally the past month for delivery running through October. Small melters of old metals have not been so active in buying, which is taken as an indication that the larger interests expect more activity in business. Scrap iron is holding even as dealers are able to place with consumers all the material that arrives in the market. Western railroads obtain higher bids at other terminals for their old material than in the Chicago market.

Pig Iron.—Interest in the iron market the past week has centered in the purchase of 40,000 to 50,000 tons by a plow manufacturer at South Bend, Ind. The main fact developed in the placing of this business is that there is no concealed weakness or distress among the furnace interests, which bid for the large tonnage offered. Prices were originally asked for prompt as well as deferred deliveries, and the only weakness that appeared in the competition was in the terms on which the business was finally closed at the prices that had been quoted for prompt shipment. Deliveries on the coke iron extend through the first half of 1911 and on the charcoal iron through the third quarter of 1911. The charcoal iron business amounted to 12,000 to 15,000 tons, taken by Michigan furnaces; the purchases of coke iron included 8000 tons of malleable Bessemer and 5000 tons of analysis, classed as basic, from Detroit furnaces; 1000 tons of high silicon iron from the Jackson County district, 2000 tons of No. 1 Northern foundry iron from a Northern furnace, and 4000 to 8000 tons of off-grade Northern foundry iron. The buyer also took 6000 to 10,000 tons of Southern foundry iron from a Cincinnati firm. The Northern iron is reported closed on the basis of $16, delivered at South Bend, for No. 2 foundry or malleable Bessemer, a price a little below the Chicago market. As might be expected, a transaction of this magnitude with a close buyer is bringing out considerable inquiry from other sources. Chicago houses now have inquiries for fully 50,000 tons of Northern foundry iron and 30,000 to 40,000 tons of Southern iron, for deliveries running through the first quarter and first half. The furnace interests, however, show no haste in closing business extending beyond the end of the year. The Southern furnaces generally ask $11.50 to $12, Birmingham, for first quarter, but buyers are unwilling to pay more than the going price, $11, for prompt shipment iron. The same conditions prevail in Northern iron, the current price being available only for prompt or early delivery. The local furnaces, after accumulating stocks at their yards for several months, shipped more iron than they made during August, and there seems to be a material improvement in the current demand, as well as in shipping orders. The prospect of a car shortage or traffic congestion, due to a shortage of motive power on the railroads, will undoubtedly lead foundries to order larger deliveries during the next two months, before the expected congestion sets in. The following prices are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—The demand for billets is light at this season, occasional sales of forging billets being made at $29 to $30, base, Chicago.

Rails and Track Supplies.—The market for standard sections is very quiet, and contracts for 1911 are not likely to come forward until late in the year. There is a little better tone in the market for track supplies and miscellaneous materials, but purchases are for immediate requirements. The light rail market continues steady. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—A little more business was closed last week for fabricated material, although the tonnage represented is still below the average for Western territory. The Worden-Allen Company booked a bridge order, 100 tons, for the Copper Range Railroad in Upper Michigan. Geo. W. Jackson, Inc., will fabricate and erect 460 tons in new buildings for the American Manganese Steel Company at Chicago Heights, Ill. The American Bridge Company took a bridge order, 385 tons, for the Northern Pacific. A new power plant building, 350 tons, for the Parlin & Orendorff Company at Canton, Ill., went to Vierling, McDowell & Co. A bridge at Judsonia, Ark., for the Missouri Pacific, 775 tons, was let to the Virginia Bridge Company and will be fabricated at that company's Memphis plant. The Realty Syndicate Building at Oakland, Cal., was let to Dyer Bros. of San Francisco. The Museum Building at Los Angeles, Cal., went to the Union Iron Works of that city. The Turner Investment Company's building at Seattle, Wash., was let to the Minneapolis Steel & Machinery Company. The structural mills in the Chicago district are comfortably booked with specifications and prices of plain material are firm. There is a large amount of new business in prospect, which, it is believed, will be ready for contracts by the time the fabricators have worked out the business now in hand. The new Union depot and terminal at Kansas City has been delayed by the financial situation, but it is expected that this job will be let by the end of the year. The Union depot in Chicago, for which plans are now nearing completion, will require 75,000 to 100,000 tons of steel, with collateral projects, as it will be a larger undertaking than the Chicago & Northwestern terminal, now nearing completion, which has required about 75,000 tons. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—New business is relatively light, but is a little better than a week ago. There is not much car business in prospect from Western railroads, but a car shortage has already made its appearance, and it is believed that the large corn crop in prospect will bring out car orders from the "granger" lines in the early future. The leading interest and all the important mills represented in this district are holding their minimum price at 1.58c., Chicago, but outside mills have taken business in narrow sizes at 1.53c. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Buyers of the middle class who order in lots from a carload to 100 tons are apparently using up their stocks, as there is a good run of orders of this size, especially for open hearth sheets. Blue annealed sheets continue firm, and prices are well maintained on small lots of black and galvanized. Large inquiries for light sheets bring out sharp competition. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Although there is not much new buying of soft steel bars, specifications during August have given the mills in this district all the business they could take care of. The steel bar trade continues the strongest branch of the market. In the case of hard steel bars new business is a little slow. The bar iron mills are still waiting for a revival of railroad purchases. The orders received are small, for immediate shipment. Outside of railroad requiements there is a fair run of orders for iron bars. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Specifications for common wire products are running heavier now than a year ago at this time, notwithstanding the fact that a general stocking up movement was in progress on the advancing prices of a year ago. There is probably less variation in the consumptive demand for wire products than in any other important finished product in the steel industry, and the present demand shows a healthy recovery since the dull period early in the summer. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The most important letting in several weeks, 3500 tons of water pipe at Kansas City, Mo., was taken by the leading pipe interest last week. This contract is for delivery this fall. There is a fair run of current orders for small lots of water and gas pipe. On current

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business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Merchant Steel.—Specifications from the agricultural trade are very satisfactory, being fully equal to last year and in many cases larger. In sales from store the average order is a little smaller than a few months ago, but the number of orders is keeping up at a very satisfactory rate. The merchant mills are now able to give prompt deliveries on a great deal of steel, which buyers could only obtain from store last winter, and the healthy volume of sales from store at this time shows that the general demand is heavy for small lots of steel. Railroad orders from store are running a little larger in average quantity.

Old Material.—While there is a great deal of talk about a better feeling in the trade, it has not taken the form of any definite movement in the scrap market. Prices are holding about the same, and dealers are divided in opinion as to whether values will go higher or lower. The railroads obtained prices for material sold the past week about in line with quotations given below, which indicates that there is no underground demand from large consumers. Old car wheels are quoted 50c. lower this week, making them lower than cast scrap, allowing for the difference between gross tons and net tons. Car wheels have declined $5 since the high point last fall, and large stocks have accumulated at foundries and in railroad yards, as evidence of the fact that railroads have fewer cars in service now than a year ago. Steel scrap is holding steady, and there is enough demand for malleable scrap and other material to keep the market clear of any congestion. Dealers' stocks are small. One of the largest yard stocks in the Chicago district was closed out last spring, and one railroad stock of 30,000 to 40,000 tons has been reduced to small proportions, so the market is in condition to respond promptly with higher prices in the event of any increase in demand. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Metals.—The paragraph usually appearing in this report will be found under the heading, "Metal Market."

William Rosenthal, formerly traveling agent for the Block-Pollak Iron Company, Chicago, has resigned his position with that company to engage in business for himself as an iron, steel and scrap broker. He has organized the William Rosenthal Iron Company, with offices at 364 Monadnock Block, Chicago.

Philadelphia

PHILADELPHIA, PA., August 30, 1910.

Continued dullness characterizes the market, although in some branches of the trade there is a better feeling, not due, however, to any materially increased volume of new business placed, but rather to the fact that consumers are beginning to show a little more interest in the situation. Transactions have usually been small and mainly to cover immediate requirements. Pig iron sales have been confined to the foundry grades, although a sale of a round lot of low phosphorus is reported. The demand for finished materials shows little betterment; a quiet business has been done in plates and shapes, but billets and sheets show no marked improvement. Price conditions are unchanged. Refined iron bars have been dull, with prices weaker. Old material is in a trifle better demand, with little change in quotations, except for No. 1 railroad wrought, which is a shade higher.

Pig Iron.—In some instances sellers report a little more business, but transactions are for the most part confined to the foundry grades and sales range from carloads to occasional 100-ton lots. Consumers in need of iron show no hesitancy in coming into the market at the present range of prices, but there has been very little buying for estimated forward needs. At the present range, $16 to $16.25, delivered, for standard brands of No. 2 X foundry iron, the market appears firm, but buyers do not feel sure that a weak seller will not yet develop, which might enable them to get in somewhat under those figures. The fact that stocks on furnace banks are accumulating in most of the producing districts lends some strength to this belief. There has been little fresh inquiry of any large size, although several round lots are still being negotiated. The cast iron pipe makers pick up odd lots of off grade iron, but would no doubt place orders for good quantities at $14.50, delivered; sellers, however, still refuse to meet that figure. Some little movement in special grades is reported, the principal sale being a lot of 1000 tons of charcoal iron at $18.75, Buffalo, for delivery over the remainder of the year. Producers feel encouraged at the freedom with which customers are taking deliveries on old and higher priced contracts, which would seem to indicate that consumption is being fairly well maintained. Sales of Virginia irons have been comparatively light; No. 2 X and No. 2 plain are being sold in small lots at unchanged prices, the majority of the producers holding firmly at $13.25 to $13.50, furnace, for No. 2 X, equal to $16 to $16.50, delivered in this territory, according to delivery point. Very few sellers will take orders, however, on which deliveries extend beyond November 1 at those figures. Little movement in forge iron is reported; an occasional inquiry for moderate lots comes out and small sales have been made at close to $15, delivered. No fresh inquiry for steel making grades has developed; the large consumer who was in the market for a considerable tonnage of low phosphorus iron has covered for a large portion of its requirements at $22.50, delivered. The iron will be taken in promptly. No demand for basic is reported. Prices generally are unchanged, the following range representing the market for standard brands, delivered in buyers' yards in this territory, shipment extending over the remainder of the year:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	15.00
Basic	15.00 to 15.25
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—No fresh demand is reported. Prices are entirely nominal and there is quite a range over which sellers state they would be willing to do business; $39 to $40, Baltimore, about represents the market for 80 per cent.

Billets.—The demand still drags. Current business is of a small lot order and mills are not very well supplied with business for forward delivery. Ordinary open hearth rolling billets are quoted at $27.50, delivered, for small lots, but makers would make concessions for a desirable tonnage. Forging billets continue fairly active, but orders are usually small. Prices for the latter grade are firm, at $29.50 to $30, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—While there has been a fair run of miscellaneous business, the aggregate volume has not been sufficient to enable mills to gain much on tonnage on the books and, as a rule, they are not very well fixed for forward business. Few orders of any size are before the trade, although moderate lots of bridge, boat and tank steel are being figured on. Prices appear firmer, at 1.55c., minimum, for ordinary plates, delivered in this vicinity, with less disposition shown to make concessions for large lots.

Structural Material.—The several propositions for additions as well as new buildings, which have been before the trade for several weeks, are still under consideration. No fresh tonnage of any size has come out, and the bulk of the business is of a small and miscellaneous character. Prices are unchanged, 1.55c. representing the minimum quotation for plain shapes delivered in this territory.

Sheets.—Business continues of a day to day character, some mills reporting the aggregate for last week to have been somewhat better than that recently taken. The bulk of the orders are for prompt delivery, consumers showing little interest in placing forward business under present market conditions. For ordinary prompt transactions prices are unchanged, but concessions ranging from $1 to $2 a ton can be had if desirable business is offered. Quotations of Eastern manufacturers range as follows for prompt lots: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

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Bars.—Even though the business offered is small, keen competition on the part of makers of refined iron bars is noted. Mills are short of orders in several instances, and while 1.40c. to 1.50c., delivered in this territory, about represents the market for refined iron bars, some producers would, no doubt, shade that price a tenth or more for desirable specifications. Steel bars continue firm, at 1.55c. to 1.60c., delivered.

Coke.—The market is not very active, but prices are firm and the proportion of low price sellers is decreasing. Sales of prompt foundry coke are reported at $2.25 per net ton, at oven, while contracts for requirements extending over the next six months have been made at $2.50 for standard foundry grades. Furnace coke is quiet, at $1.65 to $1.75, at oven. The following range about represents the market, per net ton, for deliveries in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—A little more interest has been shown in some grades, but on the whole the market still drags. A better volume of heavy melting steel is being taken by several of the Eastern mills, this being largely against old contracts. Railroad wrought is a trifle stiffer, due to the absorption, it is said, of a large share of this grade offered by the railroads, by other than the consuming interests. Sales during the week are reported at $16, delivered. The movement in other grades has been small and in some not enough business has been done to establish a market quotation. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, September 1, 1910.—(*By Telegraph.*)

Pig Iron.—The furnace interests are still holding back on next year's business and prices quoted now are considered prohibitive, when compared with prevailing figures, for delivery the remainder of the year. With the exception of the large purchase of a South Bend, Ind., plow manufacturer last week not much actual business has been transacted, but the inquiry is good and the general situation is becoming brighter. A large foundry company, having plants in various parts of the country, has sent out a request for prices from its Eastern office on over 30,000 tons of different grades of iron. A 2500-ton inquiry from a Dayton, Ohio, melter is also being worked on; 2000 tons of this is for Southern foundry, Nos. 2 and 3, and 500 tons for Northern No. 2. It is understood that this same firm has already purchased an odd lot of 200 tons of low grade Northern iron at a figure slightly below present market quotations. A central Ohio firm wants 1000 tons of malleable Bessemer for delivery the first half of next year. As freight rates to this point are practically all equal from the different districts it is expected that there will be a scramble for the order, but no price cutting is anticipated on account of the delivery date. There is also an inquiry out for a large tonnage of basic for shipment throughout 1911. Southern foundry No. 2 is quoted at $11.50, but for prompt shipment $11 can be done. Northern foundry No. 2 remains around $14.50 to $15, Ironton, with the usual reductions for lower grades. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Furnace coke for spot shipment is still weak. Some operators who had coke loaded on cars made concessions to move it quickly, and prices for prompt shipment have not been at all firm. For immediate shipment $1.50 is still being done in some sections. Contract prices remain the same as last week, and the intention of the coke producers to curtail production in line with the iron furnaces may serve to hold the market steady. Connellsville, Pocahontas and Wise County coke for future shipment are around the same figure, with $1.70 to $1.85, at oven, for the average grades. Foundry coke is very quiet. For prompt shipment some Connellsville coke has changed hands as low as $2, while some special brands have brought as high as $2.50. This same condition prevails in the Pocahontas and Wise County fields. The average contract price is about $2.10, with very little business doing.

Finished Iron and Steel.—The market is dull with only scattering orders being received. The inquiry for bars seems to be improving, but there is little actual business. We quote structural material, from warehouse, at 1.90c. to 2c. and steel bars at 1.80c.

Old Material.—The railroads continue to be indifferent sellers, and the large stocks in buyers' yards do not tend to promote much active business. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, August 30, 1910.

Iron Ore.—Ore firms are well up on shipments and the indications are that the movement from the head of the lakes will close November 10, as planned early in the season. While the August shipments will show a decrease as compared with July, the movement is still fairly heavy. More ore is being piled on the docks than a month ago and dock space is scarce, being hard to find, except where reservations had previously been made. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market shows considerable improvement both in the volume of inquiries and sales. The South Bend plow manufacturer who had an inquiry out last week is understood to have purchased about 45,000 tons, about one-half of which was sold by two Cleveland interests. Some of this is for delivery through the first half of next year. Several other sales in good sized lots are reported in the Central West. Two Michigan stove manufacturers are reported to have been buyers of considerable tonnage of foundry iron. In addition to the business closed there are inquiries pending in the same territory for about 25,000 tons of pig iron, including all grades except Bessemer. The local market is still very quiet, but some fair inquiries have come out from northern Ohio, among them one for 800 tons of Nos. 2 and 3 foundry from an implement manufacturer for the first half delivery, and one from a pump manufacturer for 150 tons of Nos. 1 and 2 for the same delivery. An Erie, Pa., engine builder is in the market for 500 tons of No. 2 for the last half. So far the renewed activity has not had the effect of stiffening prices. Some of the consumers seem disposed to buy for their first half requirements, but a number of furnace interests are as yet unwilling to quote for delivery beyond January 1. Some of the Valley furnaces are quoting 50c. above the current market for the first half delivery, or $14.50, at furnace, for No. 2. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$16.00 to $16.15
Northern foundry, No. 1	15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—The demand for foundry coke, which has been very light for a few weeks, has again become fairly active. Several inquiries are pending for contracts until July 1, 1911. The furnace coke market continues very dull. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.15 per net ton, at oven, for prompt shipment, and $2.25 to $2.50 on contract.

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Finished Iron and Steel.—Practically no change is noted in the local situation. Mills are getting a fair volume of current orders and specifications for steel bars, plates and structural material, but these orders are all for quite small tonnages. No inquiries for round lots of material have come out. Prices on steel bars remain firm at 1.40c., Pittsburgh. The 1.40c. price is being maintained on structural material, and that price on plates is being shaded by only a few of the smaller mills that make the narrow sizes. Local mill agencies report that they are not feeling the effect of this competition, and are having no trouble in booking orders on the 1.40c. basis. In structural material the American Bridge Company has taken the contract for 350 tons for bridge work for the Wheeling & Lake Erie Railroad. The Great Lakes Engineering Works has received bids for 800 tons for its new plant at Ashtabula, Ohio, and the Cleveland Electric Illuminating Company will receive bids this week for the 2500 tons required for its local plant. The Cleveland Telephone Company will have plans out this week for an addition to its building, requiring about 500 tons. With the exception of the work now actually in prospect very little additional structural work requiring tonnages of any size is at present being planned by local architects, although considerable small work is still coming out and nearly all of the local fabricating shops have all they can do. The demand for iron bars continues light. The general quotation is 1.35c. to 1.40c., Cleveland mill, the former price being for outside shipment. The demand for sheets continues inactive. Prices are weak, but no further concessions are reported. We quote black sheets at 2.20c. and galvanized at 3.20c. to 3.25c. for No. 28, and blue annealed at 1.70c. for No. 10. The demand for rivets is light and prices are weak, there being practically an open market. The usual quotations of 1.90c. for structural rivets and 2c. for boiler rivets is being shaded.

Old Material.—There was a slight flurry among dealers late last week and the impression gained ground that an early improvement in the market could be looked for, although there does not appear to be any change in the situation that would indicate a better demand in the near future. Mills show no more disposition to buy and sales have been limited almost entirely to car lots, a large part of which went to foundries. The Pennsylvania Lines West have a list out of about 2500 tons, including 1400 tons of old steel rails, and the Wheeling & Lake Erie Railroad has a small list out, both of which will close September 1. No changes are noted in quotations. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., August 29, 1910.

Though there is considerable inquiry for pig iron, mainly for far forward delivery, no large sales were made in this market the past week. Trade in coke is limited in volume. The receipts of pig iron from January 1 to August 1 were 192,490 tons; for the 12 months of 1909, 315,490 tons. Receipts of coke from January 1 to August 1, 105,100 tons; in the 12 months of 1909, 171,570 tons. The bank clearings for St. Louis and Kansas City were again in excess of the same week in 1909.

Coke.—The market is quiet, though there was a fair demand during the week from carload buyers and small consumers generally, with the usual deliveries on contract. Large consumers have mostly covered their requirements for a long period, and merchant sellers claim they are not anxious buyers, for the reason that they are inclined to believe that most of the business that has been booked in the Connellsville and Virginia fields has come from foundries and that furnaces have not been large buyers. The market is ruling fairly firm. We quote standard brands of Connellsville 72-hour foundry at $2.35 to $2.50, the first named figure for prompt and the latter for contract, per net ton, f.o.b. oven. Virginia coke, $2.25 to $2.35, f.o.b. oven. Carloads, 25c. per ton higher.

Pig Iron.—A leading broker reports an inquiry out for 5000 tons of basic for the remainder of this year and 5000 tons for shipment over the first quarter of 1911. Beyond this the week developed nothing large. Inquiries were confined almost entirely to irons of special character. There was some business offered for next year at current prices, but no furnace could be found to take it. Another sales agency reports sales aggregating 950 tons and inquiries of a miscellaneous character to the extent of 4000 tons. A third office reported inquiries for upward of 3500 tons, but regarded a part as made to keep posted. Southern foundry appears to be firmer than malleable iron and has the most attention. Southern No. 2 foundry for the remainder of the third quarter can be bought at $11, Birmingham, with the exception of certain brands. The market is regarded as $11.50, although some irons are being offered at less, but these are few and are not generally considered standard Birmingham. Ohio foundry and malleable irons are quoted at $14.50 to $15, f.o.b. furnace.

Old Material.—It is still a dull market in old material. There is some business doing in scrap steel and iron, neither kind having much call over the other, and transactions are mainly among dealers. Taking the small volume of demand from consumers and trading among dealers, together with buying from the railroads, there is just about enough business passing to make a market. The only offering for the week from the railroads was the Chicago & Eastern Illinois lot of 400 tons. Prices on some items in the list are lower, but relaying rails are quoted higher, being scarce and wanted. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.25 to 14.75
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.25 to 14.75
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Metals.—The paragraph usually appearing in this report will be found under the heading, "Metal Market."

The St. Louis Blast Furnace Company's plant closed down August 22 for repairs, involving some relining. As soon as the necessary repairs can be made operations will be resumed.

The contract for the heating apparatus for the new post office was secured by the Hanley & Casey Company, Chicago, for $75,650.

Birmingham

BIRMINGHAM, ALA., August 29, 1910.

Pig Iron.—With the probable exception of a slight concession in freight differentials to certain localities, the schedule of $11.50, Birmingham, for prompt shipments or deliveries to cover the remainder of this year, has been maintained. The business actually transacted during the week shows the general condition of the market to have improved and the tonnage involved in bona fide inquiries now pending is very attractive. So far no report has been made of transactions involving deliveries after December 31. A number of inquiries have been made, and in some cases quotations on shipments to cover the entire first half were requested, but it is understood that nominal prices only have been elicited. At last two producing interests are now quoting an advance of 50c. per ton over the $11.50 schedule for deliveries covering the last quarter, and report is made of the sale of carloads and lots of 100 tons at such figures. It is generally understood, however, that $11.50, Birmingham, correctly represents the market either for prompt shipments or deliveries to cover the remainder of this year, and that any advance over that basis, unless under special conditions, would secure first quarter tonnage. The sale of 1000 tons at $11.50, for shipment over the remainder of this year, was effected during the past week. A lot of 500 tons for comparatively early shipment, was also sold during the week at $11.50, and a lot

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of 200 tons of especial analysis iron for prompt shipment was sold at $12.50, Birmingham. There has recently been some trading in pig iron warrants and the movement from warrant yards has been increased materially. The movement from furnace yards has also increased during the past fortnight and the increase can be accurately accounted for by the number of plants now in operation that were closed down at that time. Preparations are now being made for a resumption of operations at one or more idle plants and from all indications the local melt will be normal in very short time.

Cast Iron Pipe.—A fair volume of business has been transacted in this market and the sales effected as a whole are satisfactory to producers. A leading interest now announces that order book requirements are about equal to the make for the next 60 days and in no case has the stock on hand become cumbersome. We do not have specific information as to lettings for early dates, but we are reliably informed of good prospects. Water pipe quotations have not been changed and are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe.

Old Material.—Dealers anticipate a heavy movement by reason of the recent additions to active mill capacity, but those anticipations are slow to materialize and the business actually being transacted is very light. No concessions are known to have been made that would indicate a desire to be relieved of stocks now on yards, yet all inquiries continue to have individual consideration and the market is not considered on a firm basis. Dealers adhere to former asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

San Francisco

SAN FRANCISCO, August 24, 1910.

The market in San Francisco and tributary territory remains rather quiet, the volume of new business showing little increase over that of July. A somewhat better feeling appears to exist among the jobbers, however, in anticipation of a general renewal of interest on the part of small consumers next month. Specifications for delivery from mills are coming out in a little better shape, and the distributive movement is keeping up on the same moderate scale as for some time past. A few fairly large inquiries are coming up in some departments, though the larger consumers still show hesitation in providing for future requirements. Judging by financial conditions the demand in the interior should be large, as crops have been good and prices for most California products are unusually high. There has been no curtailment of work on large improvement projects, for which a heavy tonnage will be needed at San Francisco, Los Angeles and interior points. The only particular cause for anxiety is the local labor situation. The time allotted for adjustment of the difficulties expired last week without any definite settlement, and employees are still working on an eight-hour basis. It is reported that the employers will decide upon a course of action within the next week, and in the meantime the outlook is uncertain.

Bars.—A considerable tonnage is moving on old contracts, but new business is mostly distributive. The larger buyers are beginning to take some interest, however, and while they are rather slow in placing orders they are likely to be actively in the market within a few weeks. From all indications the requirements of the consuming trade should be fully as large as last fall, though local merchants are in a position to supply a larger proportion of the demand than at that time. Jobbers are buying to some extent for future delivery, but their purchases of foreign material are being made on a smaller scale than a year ago. In view of their present large supplies, however, their purchases in the domestic market are still limited. The outlook is good for reinforcing material, for which there are some large inquiries, though most of the orders actually booked are moderate. Jobbing prices are firmly maintained, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—Local building was very quiet during the early part of the month, but is beginning to show some improvement, and according to local architects a further increase will take place within the next few weeks, as figures are to be taken shortly on several substantial structures. Two contracts of some importance have been let, both outside of San Francisco. The Ralston Iron Works will fabricate the steel for the Agricultural Building at the University of California, and the Realty Syndicate job in Oakland, over 600 tons, has been awarded to Dyer Bros. New work in San Francisco is confined to small jobs, which are fairly numerous, and mostly taken by local contractors. An award will be made in a day or two on the power house for the San Francisco Hospital. The steel contract is still withheld on the H. C. Capwell Building in Oakland and on the Eagles' Hall in San Francisco. Plans are being drawn for a large nine-story building on the Stanford lot at California and Powell streets. It is announced that the Pacific Electric Company will build a six-story steel frame building at Long Beach, Cal. Eastern fabricators are taking a number of small contracts for tank towers, &c., in interior towns. The movement of plain material on the coast is comparatively light. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—Light rails continue quiet, the movement for the summer season having been rather less than was expected except on the lightest sections. The movement of standard rails shows some increase, though individual purchases have been small. A few fairly large inquiries are coming into the market, and considerable business is expected in the North, though little is looked for from the interior of California. Interurban lines now in operation are holding off from the rail market, though they are placing some orders for general equipment. The city of Los Angeles has under consideration an ordinance requiring the use of grooved girder rails for all tracks in paved streets of that city.

Plates.—Orders are coming out in somewhat better shape than for several weeks, though the tonnage booked is still lighter than was anticipated in view of conditions last spring. The demand is still principally from fabricators of tanks and riveted pipe. Orders for this class of work are beginning to increase, though so far most of the new contracts have been small, with comparatively little business in the oil fields. An encouraging feature is the increasing use of fuel oil throughout the Pacific slope. A local oil company is planning to erect a large storage tank at Nome, Alaska.

Sheets.—Both black and galvanized sheets are in somewhat better demand than for some time, but the movement is still comparatively light.

Merchant Pipe.—The demand continues smaller than usual, even for the end of summer, but the movement both from mill and from store has increased to some extent over the extremely small volume of July. Several fair jobbing orders have been placed for country water works, and some buying of a sorting-up nature is said to have been done by local merchants, though the latter business is of small consequence. The smaller consuming trade is beginning to take a little interest in the market, but it is still too early for any large volume of distributive business, and jobbers do not anticipate much improvement before the end of the month. The local outlook is poor, but outside requirements are considered fully up to normal. No increase has been noted in the demand for either casing or line pipe in the oil fields, and there is little possibility of improvement until a market can be found for the present output of oil. While some demand may develop during the fall, conditions appear unfavorable for any large movement earlier than next spring, as delivery to the oil fields is almost impossible durin the winter season.

Cast Iron Pipe.—The movement is still very moderate, but small orders are becoming more numerous, and a few fairly large purchases have been made. The largest recent orders have come from southern California, where the United States Pipe Company has taken two orders totaling 900 tons. The city of San Diego, Cal., is planning to expend about $300,000 in water works improvements. Several water and gas corporations are coming into the market, and with inquiries coming up from a number of small municipal water works a fairly large movement is in prospect for the coming month. Fire hydrants continue in good demand all over the coast.

Pig Iron.—There is a fair demand at various points outside of San Francisco, and the local movement continues on about the same scale as for several months. Few of the foundries are in steady operation and purchases are accordingly made on only a small scale, according to current requirements, very little iron being sold to arrive. The tonnage in transit from European ports is smaller than usual, but with considerable iron in store there is no likelihood of shortage. The market is irregular, transactions being too light to establish a very definite basis of prices, though approximate values are quoted as follows: Chinese, $23; Continental, $23; English, $23 to $23.50. Special grades of Scotch iron, to arrive, are offered at $25.

Old Material.—Aside from the continued movement of

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steel scrap for shipment to Atlantic ports, the market shows little feature, prices being about as before. There is a fair demand on Puget Sound, and occasional shipments in that direction are sent from San Francisco and Los Angeles. The local demand for cast scrap is very moderate, and there is some accumulation in the hands of dealers, who are holding for full prices. Quotations are as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

The German Iron Market

BERLIN, August 19, 1910.

The situation with regard to reorganizing the pig iron trade looks less clear than it did a week ago. As was described in last week's letter, the reorganization was stated to be practically finished, but it now appears that this news was premature. On Monday came the surprising announcement that the Siegerland group had, after all, failed to join, although it had been specifically stated several days before that they had agreed to come in. This agreement, however, now appears to have been provisional—that is, they would join if the three big Siegerland concerns mentioned last week also joined. These, however, have finally refused, and that leaves the entire Siegerland group out, though it is also reported that the other concerns are likely to join, even without the three referred to. The pressure upon them is powerful on the part of the big companies of mixed production, which are engineering this new organization and doing so in their own interests. It also appears that the Luxemburg-Lorraine furnaces have not yet decided to enter, and much doubt is expressed as to their intentions. Of the big mixed companies in the lower Rhine country and the Province of Westphalia only one remains aloof of the organization—namely, the Hasper Eisen und Stahlwerk.

Bar Iron Advanced

The biggest trade news this week is that the Bar Iron Convention, which was recently prolonged to the end of next March with a larger membership, yesterday raised the price of bars for the next quarter by 2 marks the ton in general, but 3 marks for shipment to Berlin and two eastern provinces, as well as for all shipments by water inside the country. In respect to the export business, it was resolved to recommend the works to stick to a price of at least 100 marks, f.o.b. Antwerp. Not a few of them had been selling as low as 98 marks for several weeks. The new home price is 114 marks or 112 marks, according to the point from which shipment is made.

The Steel Syndicate yesterday declared business in billets and structural shapes open for the fourth quarter at unchanged prices. In some directions it is reported that the mills running on these products are less briskly employed than hitherto, but other advices state that those running on structural shapes are doing more work since the big building trades strike was settled about six or seven weeks ago. The association of manufacturers of corrugated steel tubing voted on Monday an increase in the price of their products, but the amount added was not stated. The wire rod mills are holding a meeting to-day to open business for the fourth quarter, but it is expected that they will leave prices unchanged.

Mixed Tendencies of Trade, But a Generally Better Feeling

The news from the trade this week is rather confusing and uncertain. It appears that two different tendencies prevail. In lines of merchandise, the prices of which are likely to be affected by organizations about to be completed, there is a very active demand; but business is generally quiet where this artificial stimulus is lacking. On the whole, however, the feeling in the trade is not at all bad, and one hears many expressions of confidence that business will improve during the autumn.

The ore business is quite active. The Siegerland mines are briskly employed and are gradually increasing their output. From the Luxemburg-Lorraine district, too, better business in minette ores is reported, and the mining companies have been making additions to their working force. Business in foreign ores is brisk; the prices of both Swedish and Spanish ores are still tending upward. Some German companies are reported to have recently placed long-term contracts for Swedish ores. There is no let up in the turn out of the blast furnaces. It begins to be asserted with considerable definiteness that the new organization will raise the price of pig moderately in view of the high cost of ores.

In semimanufactured steel home consumers are calling for delivery in regular course, and there is some demand still for supplementary amounts. Foreign business, however, is weaker, inasmuch as the takings of English consumers have been reduced; Belgian mills, being rather hard pressed for work, are keeping prices low for this specialty. The foreign trade in structural shapes is rather sluggish, so far as new orders are concerned; but anything under contract is called for delivery with regularity.

The heavy plate business is the only section of the trade that can boast of great activity. The export movement is large, particularly to England. The home demand has also been considerably heavier, but that will most probably now be completely reversed, a strike and lockout covering nearly the entire German shipbuilding industry having begun several days ago. In wire nails business has become somewhat better. Better buying of tubing is reported since the shops have checked the mad price cutting that followed the break-up of the trade organization.

Germany's exports of iron and steel of all kinds in July reached 392,000 tons, as against 345,400 tons in July, 1909. This was a good record, but it was 32,000 tons less than in June. For the first seven months of the year there was a gain of about 550,000 tons over 1909.

The latest news from the Belgian market is that things are improving. Prices are rising from their low level of several weeks ago. Yesterday advances of a shilling a ton on export orders for bars of wrought iron and soft steel were made. This makes a total gain of 3 shillings since the beginning of the month. German competition is preventing an advance in the price of plates.

Two furnace companies of Luxemburg, the Escherhütte and the Burbacher Hütte, are planning the erection jointly of a steel mill. The capital will be 10,000,000 francs, besides a bonded indebtedness of 15,000,000 francs.

Buffalo

BUFFALO, N. Y., August 30, 1910.

Pig Iron.—The tone of the market appears to have improved slightly during the week; at least, there is a little more live interest manifested on the part of some consumers, although the increased interest is by no means general as yet. A number of inquiries for fair sized tonnages have been received, and a number of orders, ranging from carload to 1000-ton lots, have been placed, mostly foundry grades, for prompt and last half delivery. A local radiator company is in the market for 6000 to 10,000 tons of foundry irons, and a number of inquiries for first half 1911 delivery are being received. Consequently a rather more optimistic view of the situation is being taken by many furnacemen. Moreover, a stage is being reached on furnace order books where the higher priced contracts are approaching completion and the low priced orders taken more recently predominate, showing an average price of less than cost, and statements are made that unless there is a distinct improvement in prices within the next month or six weeks additional furnaces are likely to go out of blast in preference to being operated at a loss. Prices are stationary, but in the opinion of most furnacemen are unquestionably at the bottom and will shortly begin to move upward. We quote as follows, f.o.b. Buffalo, for delivery during remainder of the year:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The week shows an improvement in most lines of finished materials, giving a total of sales for August considerably above the total for July. Buyers generally seem to have concluded that further reductions are not to be looked for and manufacturers that further cutting would not bring out more business in the long run. In steel bars an increasing number of orders are being placed at 1.45c., Pittsburgh, although 1.40c. is still the ruling price for large tonnages. One agency reports increased activity in universal rolled plates. Tin plate continues strong and there is an active market in wire products. The small job demand for structural material continues good, and there are a number of building projects under way requiring considerable tonnages of fabricated material for which specifications will soon be issued. The Lackawanna Bridge Company has received contract for the fabrication and erection of the 300 tons of steel required for the sheep pens to be erected by the New York Central Railroad Company at the East Buffalo stock yards to replace pens recently destroyed by fire. Contract for the steel for the Ford Automobile Company garage and sales building, Buffalo, was awarded to the Chas. Ernst Sons Iron Works. The Lackawanna Steel Company has completed plans for the erection of a new commercial bar mill at its South Buffalo plant, the cost of which will be $800,000.

Old Material.—The market continues dull, but the feeling among dealers is a trifle more optimistic, as there are

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some slight indications of an improvement in the demand observable and an increased buying movement is looked for within the next 30 days. Prices remain unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.25
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

Metal Market

NEW YORK, August 31, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
August.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
25	13.00	12.62½	35.00	4.40	4.30	5.35	5.20
26	13.00	12.62½	36.00	4.40	4.30	5.35	5.20
27	12.87½	12.62½	....	4.40	4.30	5.35	5.20
29	12.87½	12.62½	35.65	4.40	4.30	5.35	5.20
30	12.87½	12.62½	35.65	4.40	4.30	5.35	5.20
31	12.87½	12.62½	35.70	4.40	4.30	5.35	5.20

The price of spot tin in New York is higher than local conditions warrant, but this is because of a successful corner in London. Lake copper has softened in price, but electrolytic remains firm. Lead is fairly active and firm. The advanced price of spelter is being well maintained.

Copper.—Copper is being taken only in small quantities, and it is apparent that large consumers stocked up during the buying movement of a few weeks ago. Because of the continued inclination on the part of one prominent interest to keep the price below 13c., there have been frequent offerings of lake copper during the last few days at 12.87½c., and the market should be quoted at that figure. Notwithstanding this condition, however, there are a number of large selling interests who deal in selected brands of lake copper holding out for 13c., and they seem to have abundant faith in the situation. The London copper market, which was in the throes of a speculative movement, due perhaps to a reflection of the excitement in the tin trade there, has steadied, and that feature is lending a strong undertone of confidence to the market here. Electrolytic copper is being sold in New York at 12.62½c., and the price delivered in the Naugatuck Valley, cash in 30 days, is 12.75c. Lake copper is generally quoted at 12.87½c. The exports of copper so far this month have been fairly good, amounting in all to 26,971 tons. As there is only one day's exports to be accounted for, the trade has been able to get a fair estimate of the situation, and an encouraging report is expected from the Copper Producers' Association, which will be issued within the next 10 days. Spot copper was sold in London to-day for £55 15s. and futures for £56 11s. 3d. Sales amounted to 400 tons of spot and 800 tons of futures. The market was quiet.

Pig Tin.—The excitement in the pig tin market in London, where a corner of stocks has been very successfully managed, had its effect on the New York market this week and export tin advanced on August 26 to 36c., which is the highest price it has reached in three years. In August, 1907, spot tin was quoted at 36.12½c. The price asked for tin in New York to-day is not consistent with the actual situation, as there is a good amount of tin on hand. Nothing like a corner in spot tin exists here, although stocks are fairly well concentrated. The August statistics, which will be made public to-morrow, will show that the consumption of pig tin during the month amounted to about 3700 tons. The arrivals of tin during the month, up to this morning, amount to 4770 tons, while there are 1490 tons afloat. Of the latter none is expected to arrive to-day. At the first of the month there was about 693 tons available, and subtracting the month's consumption from the arrivals and the tin on hand at the first of the month leaves a surplus of 1763 tons, which should be ample to take care of the immediate demand. Consequently, the higher prices asked for tin in New York this week were due entirely to the speculative movement. The trading is largely between dealers, and consumers are buying metal only in cases where they are badly pinched for stocks. Spot tin was sold in New York to-day for 35.70c. In London to-day spot tin sold for £163 and futures for £159 5s., an advance of 5 shillings above this morning. Sales amounted to 140 tons of spot and 300 tons of futures. The market closed strong.

Tin Plates.—Although this is not considered the buying season in the tin plate trade, there is a very healthy demand in New York at present. The mills are still behind in deliveries. The price in New York for 100-lb. coke plates is $3.84. The foreign market in tin plates is quiet and the price has not changed in the last week. To-day tin plate was quoted at 13s. 7½d. at Swansea, Wales.

Lead.—There is a fairly good demand for lead in New York, where consumers are inclined to take advantage of the fact that the metal is being sold relatively cheaper here than in other parts of the country. The movements of the leading interest, which continues to hold the price at 4.40c., New York, as against 4.30c., St. Louis, where the market is usually 15 points lower than here, are being closely watched by other sellers, who anticipate a slight advance in this market.

Spelter.—Consumers are taking a little more interest in the spelter market and the buying was better the past week than it has been at any time within the last two months. Only small lots are being asked for, however, but the orders, coming as they do from many sources, seem to indicate that consumers who were waiting for a lower market have been obliged to take stocks to carry them along. Spelter is now being quoted at 5.35c., New York, and 5.20c., St. Louis.

Antimony.—The antimony market continues weak and very little is being taken. Cookson's is offered at 8.15c. and Hallett's can be had at 7.87½c. Some grades of Hungarian antimony are being offered as low as 7.25c., and Chinese grades are selling from 7.40c. to 7.50c. The Hungarian and Chinese grades of antimony are being used more than ever before.

Old Metals.—The market is quiet but steady, with dealers' selling prices unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, August 30.—The buying movement in copper in this market during August reached very satisfactory proportions. Casting copper is firm in 100-ton lots at the price quoted below. The corner in tin has carried the price up again. Lead is quiet and only occasional inquiries are received for spelter in car lots. Old copper is a little higher, on general strength of the market, but the smaller consumers are not very active in buying. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.25c. to 5.30c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 29.—Lead is strong, at 4.25c. to 4.30c. Spelter is firm, at 5.20c., East St. Louis. Zinc ore is steady, at $40 per ton, Joplin base. Tin is quoted at 36.60c. per pound; antimony, 8.60c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals was only moderate for the past week, but since August 1 business has been larger than for the corresponding time last year.

New York

NEW YORK, August 31, 1910.

Pig Iron.—Inquiries are more numerous. A large soil pipe company is asking for 15,000 to 30,000 tons, part for this year's and part for next year's delivery, to be furnished to its several plants in New York, New Jersey, Maryland, Alabama and Indiana. The smaller inquiries foot up quite a respectable aggregate. The sales of the week in this vicinity have not been large, but the volume of business has been slightly better than in recent weeks. It is interesting to note that requests are being received for more rapid shipments on contracts, indicating that the melt is increasing. Furnace companies are discouraging the placing of business for delivery next year, preferring to wait until the situation becomes a little clearer, hoping that a better price may then be obtained than the rates now ruling, which afford little or no profit. Quotations are unchanged, as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $16; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75.

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Finished Iron and Steel.—Improvement over the previous month was evident all through August, and particularly in the last two weeks. Prices generally are firmer, and while new business is still slack there is a decided increase in the number of inquiries in nearly all lines, indicating a prospect of better conditions in the near future. The bulk of the orders taken have been for small quantities, but they have aggregated a fair total. The plate business for this section has been holding up very well, and a good tonnage was booked in the month just ended. Bar iron orders are coming along in fair volume, and a little more desire is shown to cover for future delivery. The only structural contract of moment closed last week was the 12,000 tons for the southern half of the main building of the New York Central terminal in New York City, which has been pending for some time. It was awarded to the American Bridge Company. No decisions have been reached on the other older propositions. The New York, New Haven & Hartford Railroad has added to the number of small bridges it is in the market for, and now has a total of 14, for which something over 2000 tons will probably be required. The New Jersey Zinc Company is asking bids on an extension to its spelter department at Palmerton, which will call for about 1000 tons. Bids closed August 31 on an apartment house at Broadway and Eighty-ninth street, for which upward of 1000 tons will be needed. Prices remain unchanged, plain structural material, plates and steel bars being quoted at 1.56c. to 1.61c. and bar iron at 1.45c. to 1.50c., all New York.

Old Material.—Inquiries have increased in some grades. The demand for cast scrap is notably better. Steel scrap shows a little more life, but this is largely due to purchases by dealers, who evidently have old contracts on which shipments are now being demanded. A little more inquiry has developed for railroad wrought scrap. The rolling mill demand, however, is rather quiet, wrought pipe being no longer active, while both borings and turnings are neglected. Consumers were never so critical as they are now. Dealers are being forced to grade material much more closely and insist that they will be compelled to ask somewhat better prices for the work which this involves. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.25
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Steel Rails.—The sales of the week comprise 9000 tons of ferrotitanium Bessemer rails sold to the Chicago, Milwaukee & St. Paul Railroad by the Lackawanna Steel Company, 3200 tons to local buyers by the Illinois Steel Company and 7000 tons to the Korean Railway by the United States Steel Products Company. Inquiries are in hand for a considerable quantity of rails from domestic roads, including one for 14,000 tons and one for 13,000 tons.

Cast Iron Pipe.—The new public lettings are neither large nor numerous. The general demand continues to show some slight improvement. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Iron and Industrial Stocks

NEW YORK, August 31, 1910.

The course of the stock market has been somewhat erratic since last week's report. It was easily influenced unfavorably by political developments, but in the main showed considerable strength. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	8⅞ - 9	Nat. En. & St., com.	15½
Allis-Chalm., pref.	32	Pressed St., com.	34 - 34⅞
Beth. Steel, com.	27½ - 28½	Pressed St., pref.	95
Beth. Steel, pref.	56½ - 58½	Republic, com.	29½ - 30⅝
Can, com.	8⅛ - 8⅝	Sloss, com.	55 - 57½
Can, pref.	67½ - 68⅞	Pipe, com.	15 - 15¾
Car & Fdry, com.	46⅞ - 48⅝	U. S. Steel, com.	67⅜ - 71¼
Car & Fdry, pref.	110 - 110½	U. S. Steel, pref.	115½ - 116½
Steel Foundries	43¾ - 44	Westinghouse Elec.	57½ - 59
Colorado Fuel	28⅞ - 30¾	Am. Ship, com.	77 - 78
General Electric	142⅞ - 144⅝	Am. Ship, pref.	109
Gr. Nsore cert.	53 - 55	Chi. Pneu. Tool	35½ - 37½
Int. Harv., com.	94 - 97½	Cambria Steel	41⅞ - 42¾
Int. Harv., pref.	118½ - 119¼	Lake Sup. Corp.	20⅜ - 22
Int. Pump, com.	39	Warwick	10
Int. Pump, pref.	80 - 81	Crucible St., com.	12⅛ - 12½
Locomotive, com.	33¾ - 35¼	Crucible St., pref.	76 - 77

Dividends.—The American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 31.

The Railway Steel Spring Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 20.

The Saftey Car Heating & Lighting Company has declared the regular quarterly dividend of 2 per cent, payable October 1.

The Underwood Typewriter Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

The Lake Superior Corporation has declared a dividend of 2½ per cent. for the year ending June 30, 1910, on the $3,000,000 noncumulative 5 per cent. income bonds, payable October 1. The only previous distribution was on October 1, 1906, when the full 5 per cent. rate was paid.

The American Can Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable October 1.

Treatise on the Corrosion of Iron and Steel

In view of the present widespread discussion of the corrosion of steel and iron, the issue is timely of a comprehensive treatise on the subject by the Stark Rolling Mill Company, Canton, Ohio, maker of Toncan metal. The treatise sets forth, clearly and concisely, the facts concerning corrosion and rust, how and why they differ, their causes and what should be done to overcome them. Interesting comparisons are made of old-time iron and modern iron and steel, evincing that the degree of purity, homogeneity and density largely governs the life of iron and steel. The results of many comparative tests are shown by tables and illustrations, and these results will undoubtedly be of value to all sheet metal workers.

The general tone of the treatise is in line with the ideas of such eminent metallurgists as Cushman, Walker and Sang. No attempt is made to delve deeply into chemistry or the fine points of metallurgy. The simplicity of the English is a prominent feature, particularly when the technical nature of the subject matter is considered. The many uses to which a rust-resisting product like Toncan metal is adaptable are described and illustrated. The booklet is attractively printed.

The Greater Leavenworth Club, 529 Delaware street, Leavenworth, Kan., has issued a folder calling attention to the advantages offered by this city to manufacturers in the nature of cheap factory sites, low insurance rates, adequate transportation facilities and ample fuel and power. The city has a large area of undeveloped territory which is admirably suited to the needs of all varieties of manufacturing, as it is located on both rail and water and the freight rates are the same as those applying from Kansas City. At the present time Leavenworth has 67 industries located within its boundaries, all of which are prosperous and growing. To induce new enterprises, the club is prepared to negotiate for the donation of a free site or other reasonable bonus to any desirable business that will locate there.

Stanley G. Flagg & Co. expect on or about September 15 to remove their Philadelphia offices to the new Morris Building on Chestnut Street west of Broad street. They will then vacate their property at Nineteenth street and Philadelphia & Reading Railway Subway, where they have had their offices since 1882. Any patterns or large packages should be sent direct to their works at Stowe (Pottstown), Pa., via United States Express, or by Philadelphia & Reading Railway delivery.

Obituary

ISIDOR LOEWE, one of the most important manufacturers in Germany, died August 28. He was the head of the Ludwig Loewe Company, manufacturer of machine tools, and of the Mauser Rifle Company and a director in 15 other large manufacturing companies. He received his business training in the United States.

LUCIUS A. COLE, president of the National Lead Company, died August 25, at Carlsbad, Germany, where he had gone for his health in July. He was 62 years old. Born in Columbus, Ohio, he spent his youth in Columbus and Cincinnati. He then went to Parkersburg, W. Va., where he became associated with the late Col. W. P. Thompson in the oil business, and came to New York in 1890. In 1891 the National Lead Company was formed, of which Mr. Cole was first treasurer and later a vice-president, and when Colonel Thompson died, in 1896, he succeeded him as president. He was a director in various other companies. He leaves a widow, three sons and three daughters. Walter F. Cole, assistant treasurer of the Magnus Metal Company, New York, is one of his sons.

CHARLES T. PORTER, the eminent mechanical engineer, died in Montclair, N. J., August 29, aged 85 years. He was born in Auburn, N. Y., the son of John Porter, an eminent lawyer. He was awarded the John Fritz Medal April 13, 1909, for his work in advancing the knowledge of steam engineering and for improvement in engine construction. To him belongs the credit for first commercially demonstrating the high speed possibilities of the steam engine. He had been practically in retirement for the last 20 years owing to ill health.

AUSTIN HECKSCHER, president of the Richard Heckscher & Sons Company, Philadelphia, Pa., died August 27, at Westerly, R. I., following an operation for appendicitis, aged 52 years. He was early associated with his father, the late Richard Heckscher, in the development of the great Kohinoor coal mines in the anthracite regions at Pottsville, Pa. In 1886, together with his father and brothers, he leased the then idle blast furnaces at Swedeland, Pa., from the Philadelphia & Reading Coal & Iron Company, and effected their purchase in 1892. Under Mr. Heckscher's presidency and progressive policy since 1901 the plant has been greatly enlarged and modernized. The company has recently become affiliated with the Alan Wood Iron & Steel Company. He was also a director of the Central National Bank, Philadelphia.

CLIFFORD H. CHAFFEE, secretary and treasurer of the New York Air Brake Company, New York, died August 25, after a short illness.

FRANK H. THOMAS, a director of the De Forest Sheet & Tin Plate Company, Niles, Ohio, died on August 19, from an operation for appendicitis. He was 26 years old, and was a son of W. F. Thomas, former Mayor Niles, and for four years served as assistant postmaster at Niles.

Jones & Laughlin Improvements.—No. 1 Eliza Furnace of the Jones & Laughlin Steel Company, Pittsburgh, has been completely rebuilt in the short time of 95 days, and is again in blast. The Jones & Laughlin Steel Company awarded contracts last week for 96 additional houses for its employees at Woodlawn, Pa., the new town being built. This will give the company a total of 700 houses at Woodlawn, most of which are of brick construction, containing six rooms with bath and hot air furnace, and are modern in every detail. The company's new rod mill at Aliquippa, Pa., has been in operation for several weeks, and is operating very satisfactorily, but will not be up to full capacity for some time. The open hearth steel plant at Aliquippa, containing four Talbot open hearth furnaces, is rapidly nearing completion, and one or two of the furnaces will likely be ready for operation within the next two months.

United States Graphite Company Publications

The United States Graphite Company, Saginaw, Mich., has issued a number of exceedingly interesting publications regarding graphite. One of these is a beautifully illustrated brochure of 24 pages entitled "Graphite Mining in Mexico." The company owns the Santa Maria graphite deposits, which are located about 20 miles south of the mining town of La Colorada in central Sonora, Mexico, which were discovered in 1867. Work was begun in 1891, but commercial operations did not commence until 1895, since which time the present company has operated the mines. The illustrations show the methods employed in mining as well as Mexican social features. Another publication is the general catalogue No. 2, comprising 38 pages, which gives a complete list of the company's graphite products, with notes regarding their special uses. A third publication is entitled "Interesting Facts About Graphite Paint," and comprises 64 pages. It gives numerous illustrations of structures upon which the company's Mexican graphite paint has been used. A pamphlet of 16 pages is entitled "About Graphite Lubrication," and enters quite thoroughly into that subject. A pamphlet of 16 pages, entitled "Powdered Versus Flake Graphite for Lubrication," as its name indicates, discusses the two kinds of graphite, and presents cogent reasons why powdered graphite is claimed to be superior for lubrication purposes to flake graphite.

Dunbar Furnace Company Record.—No. 2 stack of the Dunbar Furnace Company, at Dunbar, Pa., which was put in blast in November, 1906, is still in operation and working very satisfactorily. This stack made 1929 tons of low sulphur malleable iron in the week ending August 27, and up to August 29 the stack has made 296,500 tons on the present lining, and is making about 280 tons of iron per day. The product of the company is malleable, basic, car wheel, forge and foundry grades. The stack has made only 62 tons of white iron in the last 39 months, and at present is running on malleable iron made from Lake Superior ore furnished by the Cleveland Cliffs Iron Company, and on by-product coke made in the company's Semet-Solvay ovens at Dunbar, Pa. Last week the consumption of coke per ton of iron made was 2035 lb.

The E. C. Smith Pig Iron & Coke Company was incorporated at St. Louis, Mo., August 24, with $10,000 capital stock. Edward C. Smith, the president, has been sales agent in St. Louis territory for the past six years for the Sloss-Sheffield Steel & Iron Company of Birmingham. Prior to that time he was manager at St. Louis for the Field-Evans Iron Company, following experience in the iron trade at Cincinnati with the Dayton Coal & Iron Company. The vice-president of the new company is John D. Evans, who has been in the pig iron business in St. Louis for the past nine years. E. W. Henderson, the treasurer of the company, is president of the Vandeventer Trust Company of St. Louis.

The Keystone Tube Works, which is building a new plant at Connellsville, Pa., reports that work is progressing satisfactorily, and that it will be making pipe about September 15. The company recently purchased about 5 acres of land adjoining its plant, on which extensions will be built as business increases.

The Machinery Markets

An excellent business is being done in the New York City machinery trade. There are railroad inquiries out which call for expenditures amounting to fully $250,000, and the outlook for September business is unusually good, while several houses report that their August business equals that done in June or July. A large railroad appliance manufacturing company and several other new enterprises will shortly come into the market in New York for a full line of machinery equipment, and there are many inquiries before the trade for machines for replacements. In other parts of the country reports are not quite so encouraging. The local demand in Pittsburgh is disappointing, but there is a good call for power plant and mining equipment. In Philadelphia some good railroad business has been placed, and there is a fair demand for small tools. The immediate business in Detroit and Cincinnati is somewhat slow, but a good fall business is promised in those markets. Inquiries in Chicago are scattered, and expected railroad business is still delayed. On the North Pacific Coast a good Alaskan business has developed, and some export business is coming from Australia. Export business has improved of late throughout the country, and it is thought in some quarters that this is due to the fact that many manufacturers have conducted business-getting campaigns for foreign trade to make up for the lack of domestic demand.

New York

NEW YORK, August 31, 1910.

Several New York machinery houses find that their August business was equal to that done in June and July and far ahead of the business done in August, 1909. A good illustration of the trend of business is contained in the fact that no one concern had its business swelled by unusually large orders, as most of the business done came from parties representing a varied line of manufacture and the orders were largely in small lots and principally for replacements. Just now there is a larger volume of inquiries than there has been in the last month, so the outlook is especially good. The Delaware, Lackawanna & Western Railroad has placed a few orders against a long list which has been out for several weeks, and the New York Central Lines are also placing orders against inquiries recently issued. It is estimated that the Delaware, Lackawanna & Western Railroad Company's list will call for expenditures amounting to $125,000 and the inquiries from the New York Central Lines will aggregate from $125,000 to $150,000. It is apparent that orders have been given to close out both of these lists, and this business alone should make the September trade especially good. There are a number of other large projects coming along in which active buying will be begun within the next 15 days, so that all things point to a good September business. The export trade has been especially good all summer, and from the inquiries now out it should continue good. There has been a good deal of export buying for the account of sugar plantations in Cuba and the West Indies and Mexican mining interests have been active of late. The demand for general machinery from Canada is as good now as it has been at any time within the last six months.

The United States Lighting & Heating Company, 30 Church street, New York, is preparing a list of machinery requirements to be installed in its plant at Niagara Falls, N. Y., which is now nearly constructed. The plant will include a main building, 200 x 400 ft., which has been about finished, and a number of smaller structures. The company has about 18 acres of land which will allow for future expansions. The United States Lighting & Heating Company was organized some time ago through the combination of a number of companies manufacturing electrical appliances, including lighting and heating systems for railroad trains and storage batteries for automobiles and commercial trucks. The company will not purchase any great amount of power equipment, as a contract has been made with the Electric Power & Mfg. Company for furnishing Niagara power to the works.

The Simms Magneto Company will within the next week commence the erection of a plant at Watsessing, N. J., for the manufacture of magnetos for automobile ignition. The plant will include a two-story building, 150 x 300 ft., located adjacent to the tracks of the Delaware, Lackawanna & Western Railroad at Watsessing, from which a spur will be constructed to the works. In the absence of Mr. Simms, who is at present in Europe, the purchasing of machinery will be held in abeyance, and the list will not be issued to the trade, it is understood, until late in October. William Shuler is purchasing agent for the company.

The International Harvester Company is having plans prepared for a malleable iron foundry and blacksmith shop, 450 x 500 ft., one story, which it will add to its Osborne Works, on North street and the New York Central Railroad, Auburn, N. Y. The building will be of brick, steel and concrete construction. Estimated cost, $150,000.

The item with reference to the International Auto League Tire & Rubber Company, Buffalo, N. Y., which appeared in the August 11 issue of *The Iron Age*, was erroneous in stating that ground had been broken for the company's factory at Akron, Ohio. It was the intention of the company to erect a new factory building there, and one of the directors stated to the Buffalo representative of *The Iron Age* that ground had been broken for the purpose. Later information is to the effect that before work was started the company received an offer of a building already constructed in that city and also offers of factories in two other cities, and these offers are now under consideration by the directors. The present headquarters of the company are at 72 Pine street, Buffalo.

The city of Rochester will build a refuse incinerating plant on Falls street of reinforced concrete at a cost of $100,000. F. T. Ellsworth, Commissioner of Public Works, City Hall.

The Langslow, Fowler Company, chair manufacturer, Rochester, N. Y., is erecting a new engine and boiler house of reinforced concrete at its plant on South avenue.

The Cooper Paper Box Company, Buffalo, is having plans prepared for a factory, 70 x 130 ft., three stories and basement, to be erected for its use at Sycamore and Mortimer streets.

The Cliff Paper Company, Niagara Falls, N. Y., has let contract for alterations and additions to its plant on the canal basin. The iron and steel work will be done by the Buffalo Structural Steel Company.

The Buffalo Tool & Supply Company, Buffalo, N. Y., Charles Hood, manager, 30 Chapin Block, dealer in second-hand machinery, is having plans prepared for a steel frame and glass warehouse and repair building, 75 x 350 ft., which it will erect on a two-acre site which it has recently acquired, having railroad facilities. The present city offices in the Chapin Block will be maintained.

The Watson Wagon Company has let the contract for its new wagon manufacturing plant at Canastota, N. Y., which will consist of several one and two story buildings and cost $125,000. Work will be started at once.

The Niagara Electro-Chemical Company, Niagara Falls, N. Y., will soon receive bids for a three-story grinding building, 30 x 30 ft., and an office building 40 x 103 ft., two stories, which it will add to its plant on Buffalo avenue.

Power Economies, Ltd., Montreal, P. Q., incorporated with $20,000 capital stock, has taken over the plant of the Power Economy Company, manufacturer of fuel saving specialties. The company advises it would like to negotiate with American manufacturers of power plant and fuel saving specialties with a view to handling their lines in Canada. The company will purchase a 10-in. lathe and a small drill press.

The Jule Motor Company, Ltd., 14 East King street, Toronto, recently incorporated with a $250,000 capital stock, advises that it has not definitely decided upon its plans for the future, but that it will do so at an early date.

Chicago

CHICAGO, ILL., August 30, 1910.

The Chicago machinery market continues quiet. There are no signs as yet of activity among the railroads in buying tools which they need for their shops, so that this prospective business continues to accumulate as a problem which the machine tool people will have to take care of in the fall. There are scattering inquiries from manufacturers and coun-

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try shops, and the situation seems to be improving somewhat along this line. In a large proportion of these inquiries the buyers are willing to consider second-hand tools.

General business conditions throughout the West have improved very materially the past month. There is a better feeling and more activity in the iron and steel market, and in practically every branch of business. It is the general opinion that the trade is on the eve of a healthy recovery from the dullness of the summer months, but it will take some time for this improvement to get around into the channels of the machine tool trade in the form of any considerable buying movement. The financial unrest which was so apparent two months ago and had so depressing an effect on trade has been wearing off recently. Money is growing easier and there is more of a disposition to go ahead. The railroad situation, however, will probably not be settled until the Interstate Commerce Commission reaches a decision on the important freight tariffs that were suspended last summer.

The Chicago Coach & Carriage Company, Chicago, has increased its capital stock, and advises that later on it expects to build a new factory. The company is preparing to put a new type of car on the market which necessitated additional working capital.

The Roberts Portable Oven Company, 400 West Erie Street, Chicago, manufacturer of bakers' machinery, core and enameling ovens, &c., has purchased land for a new plant, upon which the work of construction will be commenced in the near future.

Since the fire which destroyed the plant of the Chicago Rawhide Mfg. Company, Ohio and Franklin streets, Chicago, the company has concentrated its manufacturing facilities at 1301 Elston avenue, in that city, having greatly enlarged the buildings. It is the intention of the company to engage in the manufacture of metal and rawhide gears and pinions on a much larger scale than heretofore, and it has installed a complete and modern machine shop equipment with this end in view. The machinery for the new machine shop has been purchased with the exception of a planer to bevel gears, and one or two small tools. The stockholders of the company remain the same, but there has been a change in the management. The new officers are as follows: W. H. Emery, president; W. H. Doe, vice-president; John T. Emery, treasurer and general manager; W. S. Hall, secretary.

Bids will be received until September 6 by the Board of Public Works of Hammond, Ind., for one horizontal cross compound condensing crank and flywheel outside packed steam jacket pump, with a capacity of 15,000,000,000 gal. per day.

Kraut & Dohnal, Chicago, are having erected at Ohio street and Western avenue a factory building, 65 x 100 ft., which will be equipped with an electric freight elevator and a steam heating plant.

The Big Four Railway is contemplating the erection at Mattoon, Ill., of a roundhouse, terminal facilities and other improvements at a cost of $150,000.

The Pneumatic Gate Company, Chicago, has plans prepared and is taking figures for the erection of a two-story foundry building, 80 x 80 ft., to cost about $7000.

The Imperial Brass Mfg. Company, Chicago, is receiving bids through its architect, Alfred S. Alschuler, 39 Jackson boulevard, for the construction of a manufacturing plant, 100 x 125 ft., five stories.

The Commonwealth-Edison Company, Chicago, is receiving bids through its architects, Holabird & Roche, for the construction of a power generating plant consisting of five buildings.

The Baker-Vawter Company, 143 Dearborn street, Chicago, has plans prepared for a factory building, 57 x 137 ft., to be erected at Benton Harbor, Mich.

The Illinois Wesleyan University, Bloomington, Ill., has awarded the general contract to Lewis & Kitchen, 1200 Michigan avenue, Chicago, for the construction of a heating plant, 50 x 75 ft., one story.

The George Whiting Company, Chicago, manufacturer of punches and shears, is receiving bids through its architects, Huehl & Schmid, for the construction of its new machine shop, 30 x 125 ft., to be erected at the northeast corner of Elston and Wabansia avenues.

The Kankakee Gas & Electric Company, Kankakee, Ill., has been incorporated with $10,000 capital stock to operate a light, heat and power plant.

The Addressograph Company, Chicago, is receiving bids through its architect, F. E. Davidson, Monadnock Block, for electric elevators, steam heating, fore doors, sheet metal work and sprinkler system to be installed in its new factory building on West Van Buren street.

L. Kiper & Son, 500 South Peoria street, Chicago, is having erected at Sangamon and Van Buren streets an eight-story factory building, 100 x 125 ft. It will be of brick and mill construction and will require electric freight elevator and automatic sprinkler system.

The Rock Island Plow Company, Rock Island, Ill., is making rapid progress on the extensive new additions to its plant. New buildings include forge shop, pattern building, experimental building, eight-story warehouse, a large addition to the foundry and a new building for the core making department. The additions to the foundry are now well under way, and the plans include a thorough overhauling of the entire foundry equipment. A modern charging floor will be erected and a double trolley system will add greatly to the efficiency of this department.

Gault & Gault, Rose Dispensary Building, Terre Haute, Ind., are preparing plans for a central heating plant for the St. Andrew's Church in that city.

The International Harvester Company, Chicago, is having plans prepared by Architects De Vare & McGormley, Ohio Building, Toledo, Ohio, for a one-story factory building, 140 x 340 ft., to be erected in Toledo.

Spalding & Merrick, Chicago, is receiving estimates through its architects, Marshall & Fox, for the construction of a two-story building, 70 x 600 ft., which will require electric elevators and steam heating apparatus.

The A. E. Staley Starch Mfg. Company, Decatur, Ill., has awarded contracts amounting to about $75,000 to the Charles W. Gindele Company, Chicago, for the erection of new factory buildings. Contracts for electrical machinery amounting to about $25,000 will be let in the near future, together with other machinery used in making starch, which will make an expenditure of about $100,000.

The Cameron, Schroth, Cameron Company, Rush and Michigan streets, Chicago, suffered a partial loss by fire last week. Owing to the prompt work of the local fire department the damage was confined to the fifth and sixth floors. The stock was covered with tarpaulins, thus localizing the damage from water. The business of the company has not been interrupted.

Philadelphia

PHILADELPHIA, PA., August 30, 1910.

From present records, although not fully completed, both manufacturers and merchants report the month of August to have been generally dull, as might be expected from conditions governing trade in general. The vacation period, which is at its height this month, has undoubtedly delayed final action on a considerable amount of pending business, and owing to the somewhat uncertain conditions surrounding future business, prospective purchasers have in many cases decided to proceed cautiously. Manufacturers have not been affected as a rule in the same proportion as have the merchants, the former having a large number of orders on their books have had sufficient work on hand, notwithstanding declining orders, to keep them well engaged, while merchants have in instances found it profitless to have sales representatives make their usual rounds. A general revival of business along toward the latter part of September is, however, expected in practically all lines.

Few new inquiries of any consequence are reported. The demand has been confined to small tools and usually single tool propositions. Railroad buying is meager, the only inquiries coming out this week being a few small tools, including lathes and drills, inquired for by the Pennsylvania Railroad. The most important business placed has been that for a good portion of the equipment for the Scranton shops of the Delaware, Lackawanna & Western Railroad. Only a moderate share of the business was, however, directly taken by manufacturers and merchants in this vicinity. Very little demand for export is reported by the local trade. Occasional inquiries and orders for special equipment are to be noted, but that for the standard types of machine tools is quiet.

Second-hand machinery, tools and engines have not been in very active demand, this branch of the trade following the trend of the market for new equipment.

The foundry trade reports unchanged conditions. Steel casting plants are not taking on much new business, while gray iron foundries are still running, as a rule, below normal capacities.

The Eynon-Evans Mfg. Company has completed alterations by which the size of its toolroom department has been doubled. Plans for further extensions of its machine shop department, by which one story will be added, are now being prepared. This company continues reasonably busy in all its various departments.

City permits have been taken out by the William Steel & Sons Company, contractors, for a seven-story printing house at the southeast corner of Sixteenth and Appletree streets, for the Stephen Greene Estate. The building, which will cost close to $100,000, will be occupied by the Stephen Greene Company.

The Philadelphia Rapid Transit Company is preparing to

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erect trolley freight stations in several sections of the city, as well as in several suburban localities. The handling of freight by trolley cars is being given considerable attention by this company.

Robert F. Arms, who has for some time been connected with the selling forces of Manning, Maxwell & Moore, in this city, is now connected with the machine tool department of the Fairbanks Company at Seventh and Arch streets.

James N. Norris, County Controller of Luzerne County, Pa., will receive proposals at Wilkes-Barre, Pa., until September 8 for a bridge over the Susquehanna River, between the borough of Plymouth and the township of Hanover. Specifications call for seven river piers including sheet piling, foundation and reinforcement, six steel river spans, viaduct approaches, electric wiring, &c., comprising a complete bridge. Plans and specifications may be had from the County Commissioners, Wilkes-Barre, Pa., or the consulting engineers, the Schofield Engineering Company, Philadelphia, Pa.

Contractors have started work on several large additions to manufacturing plants during the past week. One, a five-story warehouse, 50 x 100 ft., will be built by Herman Voight for the Philadelphia Screen Mfg. Company, at Forty-eighth street and Paschall avenue; another has been started by J. A. Halderman, comprising a three-story addition, 32 x 50 ft., at 1014 and 1016 Dakota street, to the baking plant of A. C. Krum & Son. Builders are also estimating on an addition to the plant of the Arguto Oilless Bearing Company, 149 Wakefield street, Wayne Junction, and for a small concrete and hollow tile addition to one of the buildings of the Baldwin Locomotive Works at Eddystone, Pa.

After a delay of nearly a month contracts have been awarded by the Department of Public Works, city of Philadelphia, for work in connection with the construction of the sewage disposal plant to be erected at Holmesburg, this city. It is stated that the contract to build the pumping station and operating house was awarded to Costello & Co. Edwin H. Vare will build the intersecting sewer, while the Keystone State Construction Company will supply the pumps and other necessary machinery.

The Pennsylvania Railroad Company is taking bids for the erection of the buildings for its new shops and roundhouse to be located at Orangeville, Md., in accordance with the plan of centralizing its roundhouses and repair departments in the vicinity of Baltimore, Md. Plans call for a power house, ash pits, machine and blacksmiths' shops, oil house, storehouse, master mechanic's office and various other buildings. Bids for the erection of the buildings will be opened to-day.

R. B. Seidel, Inc., manufacturer of black lead crucibles, has completed various improvements to its plant by which the productive capacity has been increased 30 per cent. The construction of a new kiln is now being considered, which will increase the present burning capacity 40 per cent.

New England

BOSTON, MASS., August 30, 1910.

The seasonable period of stagnation is at its hight, as is always the case just preceding Labor Day, it being the culmination of the vacation months. A great many business men are absent from their offices, and the effect on the market is important. The dealers find business dull, and machine tool builders report a market correspondingly uneventful. Deliveries have improved materially with those machine tools which have been scarce because of the demands of the automobile industry. Cancellations have had their effect, and buying generally has been held up. Most business men approve the action of the banks in their new policy of conservatism as to automobile paper. They feel that expansion has been too radical in the aggregate; that the period of consolidation and elimination has begun, and that various changes in the industry will transpire during the coming year, but the eventual output of cars, pleasure and commercial, should be a very large one. Manufacturers of parts and accessories should be released gradually from a large percentage of the hold-ups of orders, which have led some of them to enter the market for other business. The trade should readjust itself shortly, which would cause a resumption of buying on a more nearly normal basis. Some observers are making the error of confounding the dog-day lethargy with the basic conditions governing the industrial situation. They make it much worse than it is. The autumn should see an improvement, gradual at first, but increasing until by October business will be back to where it was in the late spring; in other words, back to normal, using as the definition of the term the average of 10 years plus some increase for natural growth.

Vast amounts of orders are being held up which must be placed, with further accumulations, in the not distant future. One estimate is, that should the automobile trade stop buying entirely, a resumption in activity in the market by industry in general, including the railroads, would take care of the entire producing capacity of the machine tool shops of the country. It must be remembered that the general demand has been very light. A single line of business has been the mainstay of the market, constituting a factor so important as to deplete the stocks of some lines of tools. A still greater buying power is yet to exert itself. Requisitions already approved total tremendous figures.

The Potter & Johnston Machine Company, Pawtucket, R. I., manufacturer of machine tools, will add a line of cotton machinery to its product, consisting of revolving top flat cards and picking machinery. The company is building a large addition to its works, giving about an acre of additional floor space. This will permit of the extension of its machine tool department, as well as affording room for the manufacture of cotton machinery. The company has entered into a selling arrangement with the Woonsocket Machine & Press Company, Woonsocket, R. I., and the Fales & Jenks Machine Company, Pawtucket, R. I., by which the cotton machinery of the three concerns will be handled in the New England territory by William Muir, Providence, R. I., and in the South by J. H. Mayes. Arrangements have also been made by which the agents of the combination will take contracts for Nasmith combers and Hetherington mules, manufactured by John Hetherington & Sons, Ltd., Manchester, England, in cases where contracts for a complete mill equipment are involved. By this agreement it will be possible to equip a cotton mill complete. James C. Potter, who is prominent in the machinery trade as an officer of the Potter & Johnston Company, has been recognised for years as a designer of picking machinery, as well as of the metal working machinery, which has established an enviable reputation for itself all over the world.

It is stated that the Ames Plow Company, Boston, Mass., contemplates the removal of its plant at Worcester, Mass., to some other location. The site does not permit of expansion, and there is need of largely increased manufacturing space. The presumption is that new works will be built nearer Boston.

The Blanchard Machine Company, Cambridge, Mass., is bringing out a new type of vertical surface grinder for heavy work in which the principle of a revolving table is applied to standard practice as an integral part of the machine. It takes work up to 30 in. in diameter, or may be used for grinding simultaneously a number of small pieces, a magnetic clutch being employed. The machine was developed by the company to supply its own needs, and the success achieved has led to the creation of a new line of machine tools by a company which previously has devoted most of its energies to work for outside manufacturers. The shops at Cambridge are large and equipped with modern machinery.

The machine tool people will hereafter be better served in the building of heavy machinery by the Boston & Albany division of the New York Central Railroad, which has installed a 40-ton traveling crane at the Kneeland street station, Boston, covering two tracks.

The Board of Trade of Skowhegan, Maine, is promoting a plan for creating a great water power in the Kennebec River, which would involve the expenditure of $1,000,000. The proposition calls for the erection of a 40-ft. head for the entire flow of the river, or some 12,000 hp. The statement is made that banking interests are ready to finance the plan.

Geo. S. Prentice & Co., New Haven, Conn., manufacturers of automatic machinery, have purchased the motor cycle manufacturing business of L. E. Rhodes, Hartford, Conn. The understanding is that the company will devote surplus shop space to the manufacture of commercial vehicles, embodying the motor cycle principle, including small delivery wagons.

The sawmill and box factory of James Warner & Co., Orono, Maine, were burned August 24, with a loss of $150,000.

The business of the Bay State Brass Company, Haydenville, Mass., now in bankruptcy, will probably be continued, creditors believing that such a course is advisable. Stephen Jorgensen has resigned as superintendent and S. S. Cassard is in charge of the works as representative of the receiver.

Announcement is made that the Revere Rubber Company, Boston, will establish a large plant for the manufacture of automobile tires at Providence, R. I., on land recently purchased near the company's works, which formerly were operated by the Joseph Bannigan Company. Between $400,000 and $500,000 will be expended in these improvements, it is stated.

The Russell Box Company, Chelsea, Mass., will erect a new factory building on Gerrish avenue, 80 x 100 ft., three stories.

Additions to general manufacturing industries of New England include the following: The Windham Silk Company,

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Willimantic, Conn., mill 37 x 120 ft., four stories, and an additional story to the existing building; the B. P. Clapp Ammonia Company, Pawtucket, R. I., building 75 x 100 ft., one story; Sydney Blumenthal & Company, Shelton, Conn., building 50 x 120 ft., four stories.

Cleveland

CLEVELAND, OHIO, August 30, 1910.

Business in the local machinery market as a whole continues quiet, although a little improvement is noted in some lines. Orders are mostly for single tools in small sizes. This business is coming principally from small manufacturing plants and repair shops. Some orders are also being placed by steel companies for machine shop equipment. While the automobile trade is generally quiet, one or two of the Michigan manufacturers are buying equipment for plant extensions. Deliveries have gradually grown better, so that good shipments can now be secured on nearly all standard tools. While few definite inquiries are coming out, the outlook is regarded as more favorable than a month ago, and there is a general feeling that there will be considerable increase in the volume of business during the latter part of September.

In special lines the demand for industrial cars and locomotives continues quite active. The demand for equipment for hydroelectric projects is fair and some good business in that line is in prospect. The outlook for a good volume of business in mine hoists during the coming fall is quite promising.

The local manufacturing situation is fairly satisfactory. In spite of the usual summer dullness, in general business few manufacturers in metal working lines outside of the automobile trade have found it necessary to reduce the number of their employees. Conditions in the foundry trade continue quite satisfactory. Nearly all of the jobbing foundries are comfortably filled with work.

Cleveland manufacturers are planning a two weeks' trade excursion through the West during the coming fall. Thirty concerns, members of the Chamber of Commerce, have signified their willingness to participate in the trip. As soon as 50 are secured arrangements will be completed and a special train chartered. The plans provide for visits to many of the principal cities in Iowa, Nebraska, Kansas, Missouri and Illinois.

The Wellman-Seaver-Morgan Company, Cleveland, reports that orders are holding up well and inquiries indicate a good volume of business in prospect. This company now has all of its departments well filled with work for the remainder of the year. It reports the receipt recently of the following orders for Hughes gas producers: Six producers for the new plant of the American Steel & Wire Company at Birmingham, Ala.; three producers for the National Tube Company at Lorain, Ohio; ten producers of the self-cleaning type for the plant of the American Sheet & Tin Plate Company at Gary, Ind., and one standard producer for the plant of S. F. Bowser & Co., Fort Wayne, Ind. The Wellman-Seaver-Morgan Company has also recently taken some good water wheel contracts. Among these is an order from Finch, Pruyn & Co., Glens Falls, N. Y., for two units, each a 2400-hp. horizontal turbine. An order has also been received for a third water wheel unit from the A. L. Swett Electric Light & Power Company for an addition to its plant at Medina, N. Y.

The Atlas Car & Mfg. Company, Cleveland, reports that the demand for industrial cars and locomotives continues very active, and that its plant is running 24 hours a day in all departments. This company has recently received additional orders for equipment for the Panama Canal, including three locomotives and a number of electric driven automatic cars for handling concrete. Other new orders reported by this company include 300 sugar cars, several industrial electric locomotives and a number of three-phase electric transfer cars.

The American Fork & Hoe Company, formerly a New Jersey corporation with headquarters in Cleveland, has been reincorporated as an Ohio corporation and its authorized capitalization increased from $4,500,000 to $6,500,000. Not all of the additional $2,000,000 in capital stock will be issued for the present.

The Marion Shovel & Dredge Company, recently organized at Marion, Ohio, has elected the following officers: John D. Owens, president; Clifford A. Owens, first vice-president; David Evans, second vice-president; George B. Christian, Jr., third vice-president; A. E. Cheney, secretary and general manager; George D. Copeland, treasurer; Henry J. Barnhart, chief engineer. The officers comprise the Board of Directors. It is expected that a portion of the company's proposed new plant will be in operation by January 1.

The American Range & Foundry Company, Cleveland, which recently decided to enlarge its plant, has now under consideration the disposal of its present plant on Union avenue and the erection of an entirely new plant on a site near its present location, on which an option has been secured. It is expected that definite plans will be made within two weeks.

The Ferro Machine & Foundry Company, Cleveland, has increased its capital stock from $433,000 to $600,000.

J. Elkes, 407 Perry-Payne Building, Cleveland, Ohio, is in the market for the following machinery: Revolving solder roaster, baling press for light scrap, such as steel clippings and cuttings; pumps to transfer solutions from one tank to another, wire baskets about a half or 1 ton capacity, loading or shaking machine, set of rolls to press and perforate old tin cans and other light metals.

The Globe Machine & Stamping Company, Cleveland, Ohio, is having plans prepared for a manufacturing plant comprising several buildings for the construction of which bids will soon be asked. Courtney & Emerson Company, Columbia Building, are the engineers in charge.

The Empire Plow Company, Cleveland, Ohio, is having plans prepared for a two-story factory building, 80 x 80 ft., on which bids will soon be received.

Cincinnati

CINCINNATI, OHIO, August 30, 1910.

The Ohio Valley Exposition, at Cincinnati, opened its doors August 29. The machinery hall is well filled with exhibits, some of which are from outside cities. There was a large attendance on opening day, and the local machinery interests expect the exhibition will bring them some nice orders from visitors from nearby territory.

If a rule that has been established by a number of machine tool builders in this vicinity becomes general, consignment stocks of tools to agents will soon become a thing of the past. Some firms even go so far as to refuse to sell a stock outright to an agent, unless the particular tools have already been sold. One tool only of each kind is intended to be kept on hand by the agent, and so soon as sales are made the name of the customer is furnished the manufacturer before shipment is made. This places the small dealers, some of whom have the same selling ability, on the same footing with those who may be financially stronger, and eliminates any stocking up of tools by agents for speculative purposes during flush periods when premiums can be demanded from the customer for prompt shipment.

The Missouri Pacific Railroad is inquiring in this market for some tools, but if it is as slow in purchasing as some of the other Western roads have been the machine tool people will have all the time they want in which to make up figures. Then general belief is, however, that the railroads will be compelled to do some heavy buying this fall, as shop equipment is known to be badly needed by all the Western railroads.

The Oakley plant of the Cincinnati Bickford Tool Company is nearing completion and the company expects to move in its new quarters November 1. The D. T. Williams Valve Company has leased the building on Spring Grove avenue, Cincinnati, now occupied by the Cincinnati Machine Tool Company, part of the Cincinnati Bickford Company, and will move from its downtown factory as soon as the tool company can vacate the premises.

The Fairmont Mining Machinery Company, Fairmont, W. Va., is making some extensions to its plant at that point. All the new machinery and tools to be installed will have individual electric drive. Holbert & Spedden, Fairmont, are the erecting contractors.

The Newport Rolling Mill Company is now operating its large plant at Newport, Ky., on full time. Orders coming in are scattered over a wide territory and the company expects an excellent fall business.

The Croghan Foundry Company has been incorporated at Tremont, Ohio, with $10,000 capital stock, to do a general foundry business.

On August 23 fire almost completely destroyed the plant of the Akron Tile & Roofing Company, Akron, Ohio. It is understood that the factory will be rebuilt at an early date.

The capital stock of the Toledo Computing Scale Company has been increased to $900,000, but no additions to its plant are planned for the near future.

The Central Wire & Iron Works, Indianapolis, Ind., incorporated with $5000 capital stock, has purchased the plant formerly owned and operated by F. B. Alley of that city. No improvements are contemplated, it being the intention of the company to manufacture the same lines as were manufactured by Mr. Alley.

The Seagrave Company, Central National Bank Building, Columbus, Ohio, has plans prepared for a two-story blacksmith shop, 50 x 167 ft., on which bids will soon be received.

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Cambridge City, Ind., will improve its light and water plants at a cost of $8000.

It is expected that the construction of the four additions to the Champion Division of the International Harvester Company's plant at Springfield, Ohio, will be started about September 1. There has been considerable delay in starting these buildings, owing to the fact that the plans and specifications were changed, the officers of the company having decided to make them larger than at first intended. Additional ground has been purchased for a new blacksmith shop and gray iron foundry.

Detroit

DETROIT, MICH., August 30, 1910.

Manufacturers, jobbers and dealers generally all through this territory are engaged at present in preparing for the opening of fall trade. Accumulations of shop-worn, slightly damaged or otherwise inferior material have been largely disposed of at a sacrifice to make room for new stock, and there is a notable movement everywhere to get business in line for prompt deliveries a little later on. Manufacturers are devoting particular attention to the production of parts which require the most time for machining and finishing, thereby putting them in a position to turn out the remaining parts quickly and assemble the complete apparatus in relatively short order. Standardization of all parts which can be made interchangeable has also progressed farther this year than in any previous season, and that fact alone will exert an appreciable influence upon future deliveries. The booking of new orders is slow at present, but prices hold firm and the market shows no signs of weakness.

The American Supply & Machinery Manufacturers Association, which numbers among its members the American Blower Company, American Injector Company, Detroit Lubricator Company, Detroit Oak Belting Company, Sterling & Skinner Mfg. Company, Roberts Brass Mfg. Company, Penberthy Injector Company and McRace & Roberts Company, Detroit; United States Graphite Company, Saginaw; Union Steam Pump Company and H. B. Sherman Mfg. Company, Battle Creek; Oliver Machinery Company, Grand Rapids, and Lufkin Rule Company, Saginaw, Mich., has opened a bureau of information at 55 Woodbridge street, Detroit, with Wm. M. Chamberlain in charge.

The new machine shop of the Root Spring Scraper Company, Kalamazoo, Mich., has been placed in service, and production for the coming year will be considerably enlarged.

The Lake Shore Engine Works, Marquette, Mich., has built for the Butte Balaklava Copper Company, Butte, Mont., an electric motor driven hoist of 300 hp., which is attracting a great deal of attention from mine operators. From the arrangement shown by the photograph of this machine, it is apparent that the unit is compactly constructed and capable of easy control.

Funds for the city water works at Imlay City, Mich., are being provided, and the matter of their suitable expenditure will be taken up in September.

The Yeomans Body & Box Company, Detroit, has been combined with the Monroe Body Company, Pontiac, Mich., in the name of the latter, and both plants will be operated to capacity. The capital stock of the enlarged company has been increased to $500,000.

A new building, 95 x 100 ft., which will be used as an automobile garage and probably also equipped for repair work, is to be erected by the Goodfellow Tire Company in Detroit. B. C. Wetzel & Co. of this city are in charge of the plans.

The Koenitzer Company, Saginaw, Mich., has under consideration the rebuilding of its plant, which recently burned. This was completed last spring, having been designed along the most modern lines by the Chas. H. Stehling Company, Milwauke, Wis., and will probably be practically duplicated.

Geo. W. Brown, Sturgis, Mich., has had work started on a brick and concrete furniture factory at Glengarry, near Bagnall (P. O.), Mich.

The Anhut Motor Car Company, Detroit, has changed its name to the Barnes Motor Car Company.

Unless other arrangements for power are made, a large electric generating station will be needed by completion of the Detroit & Lansing Railway, for which the St. Johns Construction Company, Chicago, are reported to have the construction contract. Further particulars are, however, not available at this time.

The De Pree Chemical Company, Holland, Mich., has let contract for a three-story building, 40 x 90 ft., to be used in its testing department.

A two-story addition will be made to the factory of the O. & W. Thum Company, Grand Rapids, Mich.

An addition to the automobile industry of Detroit is to be found in the establishment of the Puncture Proof Tire Company, which recently opened a shop at 269 Beaubien street.

The American Injector Company, Detroit, has maintained to excellent advantage this season its sales of the U. S. injector for boiler feed service, installations of which are to be found in almost every industrial community, including practically all of any importance. For the coming year a further increase in production will undoubtedly be necessary.

W. B. Mershon, Saginaw, Mich., is among the delegates appointed by Governor Warner to attend the National Conservation Congress at St. Paul, Minn.

The Winona Copper Mining Company, Houghton, Mich., is installing a new crushing plant, which will be equipped with heavy steam stamps of the same general pattern as those originally designed for Lake Superior copper mines by Edwin Reynolds. The new machines have been built in the Chicago works of the Allis-Chalmers Company, Milwaukee, and are among the first of the kind to be constructed for many years.

It is reported from Greensburgh, Ind., that a company known as the Carr-Lasner Radiator Company has secured a site there upon which to erect a manufacturing plant. The product will be taken by automobile makers.

The production facilities of the Michigan Turpentine Company, Bay City, Mich., are to be increased.

The Cooley Automobile & Tire Company has been incorporated to establish a plant in Detroit for the manufacture of motor cars and a new patent tire, the latter being the main product. John B. Chaddock is president; L. D. Cooley, vice-president and general manager, and F. H. McMullen, secretary. The capital stock is $50,000.

The Hancock Consolidated Mining Company, Hancock, Mich., is putting in service a new power plant, with hoisting engine and air compressor. A stamp mill will be erected as soon as the production is sufficient in volume to warrant it, and other machinery purchased at intervals as development work progresses.

The Toledo Massillon Bridge Company, Toledo, Ohio, is employing more lathe, planer and bench hands. Orders on the books are sufficient to insure work in the shops for some time ahead.

A new sewage plant, with pumps having a capacity of 3,000,000 gal. daily, will be built at Cadillac, Mich.

The Huron River Mfg. Company has been organized at Ann Arbor, Mich., to establish a plant for the production of automobiles and their parts. Bids are now being taken on the first of the new factory buildings to be erected, which is 40 x 456 ft.

Following the sale of bonds recently voted, an electric power station for municipal service is to be erected at Muskegon, Mich. The purchase of machinery will be taken up some time this fall.

The Wright Cooler & Hood Mfg. Company, Chicago, manufacturer of automobile parts, is having plans prepared for a one-story factory building, 99 x 141 ft., to be erected at Muskegon, Mich.

The Wolverine Brass Works, Grand Rapids, Mich., has issued an increase of $1,000,000 to its capital stock, to be used for extra working capital. The company recently completed several new additions to its plant.

Sealed proposals will be received by the city of Grand Rapids, Mich., until September 8, for the construction of a filtration plant.

The Ayers Engine & Motor Company, Trenton, Mich., recently incorporated, has taken over the business of the Ayers Engine Works of Rochester, Mich., and the Gilmore Motor Company, Detroit, Mich., manufacturers of portable and stationary engines and marine motors. The company has in the course of erection a new factory building, 50 x 170 ft., which is expected to be ready for occupancy by October 1. Practically all of the machinery and equipment required has been purchased.

The Michigan Crank Shaft Company, Detroit, Mich., will erect a factory building, 64 x 138 ft., and an office building, 18 x 37 ft., two stories.

Milwaukee

MILWAUKEE, WIS., August 29, 1910.

Trade during the past week has been only fair, and in the orders recently booked the smaller manufacturers, together with dealers, seem to be better represented than the large machinery builders of the State. The latter, however, have negotiations pending that are practically certain within the coming month to lead to the closing of quite a number of contracts of considerable size, and the situation is looked upon as favorable.

Sales of machine shop and foundry equipment are

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likely to be rather light for a time. There have recently been numerous installations of new tools in the plants or additions started last spring, and probably as many more are to be made by October 1. Purchases during the near future will be confined almost wholly to replacements, and many of these will not be determined upon until after the usual September meetings of directors or others identified with local industries.

In addition to the Newport mine, for which a large quantity of machinery has been purchased in recent years, Ferdinand Schleisinger, Milwaukee, will open up a new property on the Gogebic range in the Bessemer district of upper Michigan. This is to be operated under lease, which is reported to contain an agreement calling for the expenditure of $250,000 in development work within the next five years.

Ground has just been broken here for the immense new foundry of the International Harvester Company.

W. G. Kirchoffer, Madison, Wis., is preparing plans for a pumping plant to serve the city of Gresham, Wis. Specifications covering machinery will be ready in the near future.

The Beaver Dam Foundry Company, Beaver Dam, Wis., is preparing to install electric power equipment, taking its current from the mains of the Beaver Dam Light & Power Company.

The Mitchell-Lewis Motor Company, Racine, Wis., is reported, on apparently authentic information, to be preparing to enter upon the manufacture of aeroplanes on a commercial scale. A new form of motor is being developed for the purpose.

The Minneapolis Motor & Truck Company will have a new plant at Downing, Wis., the dimensions of which are given as 100 x 200 ft., two stories.

C. E. Search, manager of the production department of the Allis-Chalmers Company, who resigned some months ago for a period of rest and recuperation, has returned and will take up similar duties at the plant in West Allis.

The Cedarburg Box & Woodwork Mfg. Company, recently organized at Cedarburg, Wis., is taking bids on a new factory building. For driving the machinery, which is to be purchased shortly, electric motors will be used, power being purchased from the municipal plant.

The Milwaukee Separator Company, Milwaukee, which now operates in leased quarters, is planning to build a factory of its own, equipped with electric power.

A hydroelectric power plant will be built and equipped in the spring by the John Arpin Lumber Company, Grand Rapids, Wis., the location being at Radisson, Wis., where a timber dam is now under construction.

From Kaugauna, Wis., it is reported that Geo. L. Smith of that place is preparing plans for a large manufacturing plant to be built at Ashland, Wis., by a new concern that will be known as the Ashland Paper Company. The organization of the latter has not yet, however, been completely effected.

The contract for a new steel highway bridge over the Peshtigo River, near Marinette, Wis., has been taken by the Elkhart Bridge & Iron Company, Elkhart, Ind.

It is reported from Racine, Wis., that the Racine-Sattley Company has disposed of its wagon business to the Fish Bros. Mfg. Company, Clinton, Iowa, and will devote its attention henceforth to the manufacture of automobiles. This is not yet, however, officially confirmed.

The Janesville Machine Company, Janesville, Wis., is taking bids on two elevators, each 1½ tons capacity, for its new shop building. They are to be 7 x 15 ft. square for 60-ft. lift, and driven by electric motors.

The Milwaukee Bridge Company, Milwaukee, will furnish the steel work for a new viaduct to be built at Sheboygan, Wis.

L. H. Hall, Wausau, Wis., is maturing plans for the establishment of a plant to manufacture a new automobile of his design.

The new steel water tower required for municipal service at Waterloo, Wis., will be erected by the Chicago Bridge & Iron Works, Chicago, Ill.

The Albany Electric Light & Milling Company, Albany, Wis., is having plans drawn for a power plant, with hydraulic turbines connected to alternating current generators by shafting and rope drive.

The Templeton-Barrett Company, Milwaukee, Wis., manufacturer of kitchen specialties, will remove its plant and business to Marinette, Wis., where it will occupy quarters secured through the Chamber of Commerce of that city.

The La Crosse Plow Company, La Crosse, Wis., has increased its facilities by the purchase of a building containing 50,000 sq. ft. of floor space, which will be used for manufacturing and warehouse purposes. Orders for all necessary equipment have been placed.

The Racine Mfg. Company, Racine, Wis., is contemplating the erection of a four-story brick factory building, which will be fully equipped with automatic sprinklers.

The Berlin Machine Works, Beloit, Wis., is having plans prepared for a three-story addition, 55 x 120 ft., to be erected in connection with its present plant.

Baltimore

BALTIMORE, MD., August 30, 1910.

While the month of August has not been particularly active in some lines, trade generally has been about up to the usual average for the season, and in some instances business has exceeded that transacted in July. The call for machine tools has been quiet, a number of good propositions are pending, but both manufacturers and merchants note considerable difficulty in closing up business under negotiation. There has been a smaller general demand from the South. The railroads show little disposition to come into the market for any extended equipment or supplies. In this vicinity the demand for power equipment, particularly for heating, lighting and ventilating purposes, has been quite good; several fair contracts of this character, in connection with new building work have been closed, while several additional ones are still under negotiations. While some few contracts for structural work in connection with buildings have been placed, fabricators report a falling off in the demand. Subcontracts in connection with building work have been more freely placed, although considerable work of this character is still held up. The call for small shop supplies is up to the average and in instances reported better than last month. The foundry trade is not actively engaged, there is little demand for machinery castings and jobbing foundries are not very busy, except those making castings for the building trade. On the average foundry plants may be said to be operating at about 75 per cent. of full capacity.

Contractors and builders are well engaged, there is a large amount of municipal work under way and a fair demand for contractors' supplies and equipment is reported.

Industrial establishments generally are fairly well engaged, not so much on orders recently taken, but rather on contracts booked earlier in the year, on which deliveries are now being made as a rule. Those engaged in the various branches of the iron and steel trades have enough work ahead to keep them fully engaged for several months at least, before the expiration of which a general betterment in trade conditions is anticipated.

The Montgomery Chemical Company, Derwood, Md., will make considerable improvements to its plant, for the manufacture of case hardening compounds. A carbonizing plant, including a gaseous fired bench of six vertical retorts, gas producers and special apparatus for the prevention of smoke and odors and facilities for reclaiming of by-products will be installed. The engineering and chemical departments of the Baltimore Retort & Fire Brick Works, Baltimore, Md., are to supervise the work.

The general contract for the addition to the Hochschild-Kohn Company's department store has, it is stated, been awarded to Morrow Brothers, contracting builders. With the exception of the power plant, the various subcontracts are understood to have been placed. About 600 tons of structural material will be required.

The Monumental Brewing Company will erect a bottling plant at Seventh and Lombard streets, Highlandtown, Baltimore County, Md. The building is to be 100 x 400 ft., four stories. Steam heat, electric light and elevators are to be installed.

Joseph Goller, Mack River, Baltimore County, Md., will install a new generating plant. A 300-kw. alternating current generator and boilers are being considered. The new plant is to be put in during the early fall.

It has been announced that the contract for the erection of the new warehouse for William Keyser, on Grant street, between Pratt and Lombard streets, has been awarded to Edward Pilert. It will have a frontage of 40 ft. and extend back to Hollingsworth street. It will be three stories of brick and of general mill construction.

The contract for the high pressure pumping station, to be erected on South street, between Pratt and Lombard streets, for the city of Baltimore, for which the Bennett Building Company was the bidder under original specifications and low bidder under revised proposals, was awarded the contract at $148,000.

Competitive plans are to be prepared for a new theater to be built at 307-315 West Fayette street. The proposed building, which is to cost $100,000, will have a frontage of 125 ft. and a depth of 150 ft., be thoroughly fireproof and modern in every detail. The property on which the theater is to be erected has been purchased, but not until after January 1 will any actual construction work be done.

The Pennsylvania Railroad Company received proposals on August 31 for the erection of a number of buildings to comprise its Orangeville, Md., repair shops and round house. A number of Baltimore contractors are bidding.

The Montford Machine Casting Company reports the de-

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mand for machinery castings quiet; a fair run of jobbing work is, however, being taken, but business at this season is not up to normal and competition is very keen. Orders on hand are sufficient to keep the plant fairly well engaged.

The Weatherproofing Nail Company, 451 North avenue, is inspecting several factory buildings with a view of obtaining larger quarters for the manufacture of its products. Its present plant is too small for its business and more extensive quarters will be taken prior to the end of the year.

Crook-Kries & Co. have the contracts for the heating plant in connection with the addition to be built for the United States Fidelity and Guarantee Company; also for extending the present heating system of St. Mary's Industrial School. This company is extremely busy on work in hand and is figuring on a number of important heating and ventilating propositions as well as power installations.

The Baltimore Buggy Top Mfg. Company has purchased property at Maryland and Mt. Royal avenue, 75 x 124 ft., and will erect a three-story factory and salesroom. The contract for the building has been awarded to McLaughlin Bros., 915 Bolton street. Electric elevators, lighting and steam heat will be installed.

The Baltimore Bridge Company is operating its plant at full capacity, with some departments working overtime, in order to complete contracts on hand. Work is progressing rapidly on the Southern Building in Washington and the Emerson and Fidelity buildings in this city. Deliveries on a considerable volume of export work to South America are practically completed. New business has been somewhat less active, due in a measure to the inability to make early deliveries, the capacity of the plant at least two months being fully taxed.

The Detrich & Harvey Machine Company reports the usual seasonable dullness during August. A large volume of business is under negotiation, but for the most part prospective customers show little disposition to place orders. New business during the month has not been heavy, although deliveries on contracts in hand have been numerous. The plant is running at full capacity, orders taken earlier in the year being sufficient to keep it so occupied for several months.

T. C. Bashor & Co. have taken the contract for the power plant for the Munsey Building, in which three 125-hp. marine type boilers will be installed. Three 250-hp. corrugated firebox boilers are building for a New York customer, while orders for tanks of various sizes have been quite numerous. The boiler plant is operating at full capacity, and there is a very fair volume of new work being figured on. Business taken during August has been fully up to the average.

Friedenwald Brothers are quite busy. While domestic business has not been particularly active they have a large amount of work on their books for special machinery for the Crown Cork Company, Ltd., London, England, for its branch offices in Yokohama, Japan; Hamburg, Germany, and Rio Janeiro, Brazil. This machinery is used for the manufacture of the crown cork and seal in foreign countries.

Dietrich Brothers have been awarded the contract for the structural steel work for the addition to the United States Fidelity & Guarantee Company, requiring about 300 tons of shapes. They have also been awarded the structural steel and ornamental iron work in connection with the O'Neil Building; about 200 tons of structural material are involved. This concern reports a very fair run of business and is operating its plant at full capacity.

The Baltimore Retort & Fire Brick Company, which increased its capital from $50,000 to $100,000 subsequent to the fire which destroyed the plant about two years ago, will, without increasing its indebtedness, issue preferred stock to the value of $25,000 to provide additional working capital. Improvements to plant are contemplated, including the installation of a complete system of industrial railways. The plant is operating at full capacity, having a number of contracts for coal gas benches, including a large installation at Valdosta, Ga.; Charleston, S. C., and in the New England States, as well as orders for special fire clay shapes and brick being on its books.

Quite a few subcontracts for new buildings and additions in Baltimore and vicinity, for which general contracts have been placed, are still unclosed, among which are the power and heating plant for the Baltimore City Hospital, the boiler and heating plant for the Emmerson Building and the Emmerson Hotel. That for the elevators of the latter is expected to be closed during the current week.

Plans are in progress by C. L. Reeder, engineer, for a new office building for the American Agricultural & Chemical Company at South and Water streets, from plans by Owens & Siscoe, architects. A modern five-story brick building, 20 x 83 ft., is proposed.

At a meeting of the directors of the Frederick Railroad Company, Frederick, Md., extensive plans for improvements to the company's lines were determined upon. The electrification of the line from Frederick to Thurston was ordered. This branch has been operated as a steam road and the freight traffic will probably continue to be handled by that method. Some extension of the company's railway in Frederick was also decided. Plans for the erection of a large power plant, to be built jointly by the Frederick Railroad Company and the Hagerstown Railroad Company, to furnish power to both roads, were also practically agreed upon, although its location was not finally decided, but will probably be in the vicinity of Hagerstown, Md. A new corporation, the stock of which will be held by both railroad companies, will be formed to build and operate the power plant.

The Maryland & Pennsylvania Railroad Company is building a new round house and repair shop about a quarter of a mile above its present shops on Falls road, Baltimore. The round house will have a capacity for 17 stalls, although about one-half will be used at the time for a machine shop, carpenter shop, paint shop and minor offices. J. S. Morris is general manager.

St. Louis

ST. LOUIS, August 29, 1910.

The manufacturers of woodworking machinery find the demand quite slow, as the lumber producing industry seems to be passing through a rather unprofitable period. The production of lumber is excessive, and this combined with the increasing use of concrete and steel makes the business unremunerative.

The Moran Bolt & Nut Company and the St. Louis Screw Company find business very fair for this time of year.

The Lambert Hoisting Engine Company is putting in a stock of its hoisting engines at its store here, 717 North Second street. This agency handles a wide territory from St. Louis.

The eight plants of the American Car & Foundry Company in St. Louis and suburbs are running rather slow, owing to the railroads' present policy of curtailing equipment purchases. The new plant at St. Charles, Mo., is now pretty well completed. This plant will specialize on all-steel passenger equipment.

The Elliot Frog & Switch Company and the St. Louis Frog & Switch Company are both getting a fair run of orders for their specialties.

The St. Louis Axle Company is preparing to rebuild its foundry, recently destroyed by fire. Most of the machinery will be still available after some repairs.

The St. Louis Gas & Gasoline Engine Company, manufacturer of marine gasoline engines, finds business very fair for this time of year.

The American Steel Foundries, Commonwealth Steel Company and Scullin-Gallagher Iron & Steel Company are all greatly rushed with steel casting work for railroads, &c.

The National Carton Sealing Machine Mfg. Company, St. Louis, has been incorporated, capital stock, $50,000. The incorporators are George A. Cullum, August B. Cullum and Luther A. Nelson.

The Blechschmidt-Tallman Machinery Company, St. Louis, has been incorporated, capital stock, $10,000; incorporators—J. Blechschmidt, Roscoe S. Tallman and B. E. Hamilton.

The Missouri, Kansas & Texas Railroad will expend $100,000 for installing an electric conveyor system in the big freight houses now being constructed at Broadway and Mullanphry street. The system is patented by the Sprague Electric Company and is an electrically propelled tramway built in the platforms, for conveying all kinds of freight to and from the cars for loading and unloading.

The Vaughan-Minnig Shoe Company is erecting a $20,000 factory at Marshall, Mo., and as soon as the building is completed will remove to Marshall from Jefferson City.

The Otis Elevator Company has let the contract for the construction of an addition to its plant near Alton, Ill. The new building will cost about $60,000. The addition will be known as the woodworking shop and will be 132 x 226 ft.

The National Hydraulic Tire Setter Company, incorporated under the laws of Iowa, licensed to do business in Illinois, has erected at Springfield, Ill., a modern saw tooth factory, 75 x 80 ft., and the company is about ready to let the contract for another building of the same size. Two machines are manufactured—large and small. Also hydraulic box setters, hub binders, &c. The president of the company is H. M. Lourie.

W. B. Schnatterly, Nevada, Mo., has purchased a lot corner of Hunter and Cedar streets and will build a modern two-story machine shop. The building will be of brick, 24 x 60 ft.

The repair shop of the Western Motor Car Company, Springfield, Mo., has been purchased by Don L. Cross of Aurora, Mo., and L. N. Rinaman of Springfield. They will conduct business as the Ozark Motor Car & Machine Com-

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pany and will do a repair business, as well as the building of automobiles.

The National Lumber & Creosoting Company has commenced work on a paving block plant at Texarkana, Ark., to cost about $5000.

L. I. Barnes of Humboldt, Kan., and S. C. Garrett of Kansas City, Mo., will erect a cement factory near Tulsa, Okla. The plant will cost, it is stated, in the neighborhood of $1,250,000 and will be located on the railroad, near an extensive limestone district.

The reorganization of the Mapleton Gas Company, Mapleton, Iowa, has been completed and the following officers elected: J. E. Duschl, president; M. J. Goldberger, vice-president, and C. C. Jacobson, secretary and treasurer. A new gas house will be erected along with other buildings. The Tenny process carbureted water gas will be installed.

The Dowden Mfg. Company, Prairie City, Iowa, manufacturer of potato diggers, &c., will build an extension to its factory, 40 x 120 ft. The plant of the company covers about two city blocks.

Blue Hill, Neb., will install an electric lighting system in connection with the present water works plant.

The Lehigh Portland Cement Company has commenced work on its new plant at Mason City, Iowa. It will have a capacity of 5000 bbls. per day, and it is reported the cost of the works will be in the neighborhood of $2,000,000. The company owns 700 acres in the vicinity of Mason City.

The St. Louis Cotton Compress Company, at Hope, Ark., located at Main and Division streets, is to be removed to its new plant, which will be erected north of the city. It will be equipped with modern steam and hydraulic presses, and will represent an investment of between $40,000 and $50,000, with a capacity of 150 bales per hour and shed capacity of 20,000 bales.

The Contracting Machinery Company, Kansas City, Mo., has been incorporated, capital stock, $50,000; incorporators—J. W. Hoover, Louis A. Miller and Howard N. Hanson.

The Benton Peerless Mills, Benton, Ill., has been incorporated, capital stock, $20,000; incorporators—T. K. Ford, W. W. McCreery and Robert R. Ward.

The Okawville Electric Light & Ice Company, Okawville, Ill., has been incorporated, capital stock, $10,000; incorporators—John Fletsam, John J. Frank and Wm. F. Gagenbusch.

The J. F. Meyer Mfg. Company, Hannibal, Mo., has been incorporated, capital stock, $50,000; incorporators—O. B. Meyers, Arch. P. Meyers and J. Fred. Meyers.

The Dinks Parish Laundry Company, St. Louis, has been incorporated, capital stock, fully paid, $25,000; incorporators—D. L. Parrish, Chas. G. Givin, A. F. Williamson, and others. The company will establish a plant at Oklahoma City, Okla. The building and ground will cost $25,000.

The T. L. Horn Trunk Company, St. Louis, Mo., has leased for a period of 10 years the four-story building at the corner of Eighth and Howard streets, where it will consolidate the business of its several plants. The present factories of the company are fully equipped, but it is probable that additional equipment may be purchased at a later date.

Machinery for a pumping station to be built by the city is to be bought in October or November at Laplata, Mo.

The South

ATLANTA, GA., August 29, 1910.

Engineers engaged by municipalities and county boards, following the elections in which bond issues for improvements were voted, have within the past five or six weeks submitted numerous plans for pumping plants, electric power and lighting stations, filtration works, distribution systems, refuse destructors, &c., the month of August having been an especially active one in this respect. Consequently the buying of machinery for these various projects, which began early in the summer, has increased to an extent that overshadows every other line. At present it gives life to a market which would otherwise be extremely dull. Builders of boilers, heaters, storage tanks, reservoirs, &c., and manufacturers of pipes, valves, hydrants, pressure regulators or other auxiliary apparatus are also kept going in pretty good shape by the strength of this demand. In general the situation may be accurately gauged by the reports in *The Iron Age* of the past fortnight.

Boilers for the new municipal pumping plant at Gadsden, Ala., will be furnished by the Casey & Hedges Company, Chattanooga, Tenn.

Work is about to begin on the additions to be made to the shops of the Louisville & Nashville Railroad at New Decatur, Ala.

The construction of a municipal pumping plant has been decided upon at Seminary, Miss. An elevated steel storage tank may also be required.

The city electric plant at Pulaski, Tenn., which has a present capacity of 75 kw., will be enlarged and improved. Plans to that end are now under discussion by the authorities.

The machine shops of the Grant Land & Lumber Company, Selma, La., recently mentioned, in which an auto logging wagon is now being constructed, are among the most modern of any in the South, being equipped to handle anything from a jack to a locomotive. The company is a buyer, at frequent intervals, of the class of machinery and material usual to such shops.

The authorities at Thibodaux, La., have accepted the plans of G. U. Borde, New Orleans, La., for an electric power and pumping plant, the funds for which are already available. Purchase of the machinery will now be considered.

The Atlas Machine Company, Nashville, Tenn., which makes a specialty of woodworking tools, is putting on the market a new type of picket pointer that can be very easily and economically operated.

The municipal power station at Cairo, Ga., which is equipped with a Crocker-Wheeler generator of 50 kw., driven by a Harrisburg engine, will be more than doubled in capacity during the fall and early winter by the installation of new machinery. None of the proposed equipment appears to have as yet been purchased.

The Home Light & Power Company, recently organized at Greenville, S. C., is preparing to put in execution plans for an electric generating plant.

The purchase of machinery for an electric power and pumping station will be authorized shortly at Rutherfordton, N. C., where a bond issue for the purpose has been voted.

A new veneer cutting plant, the main building of which will be 75 x 130 ft., is planned for erection in Stockton, Ala., by the Bacon-Underwood Veneer Company, Birmingham, Ala.

The authorities at Albertville, Ala., have under discussion the construction of a pumping plant and water works system.

The installation of pumping machinery for municipal service is being planned at Cleveland, Miss.

The contract for a steel bridge over the Conasauga River at Conasauga, Tenn., has been awarded the Joliet Bridge & Iron Company, Joliet, Ill.

The Primo Motor Car Company, Atlanta, Ga., whose organization and plans have previously been mentioned in *The Iron Age*, was recently incorporated for $150,000.

Three Curtis steam turbines and generators, with an aggregate output of 9000 kw and large overload capacity, are to be installed in the Ensley, Ala., power plant of the Tennessee Coal, Iron & Railroad Company. Some auxiliary apparatus will be needed later.

The Northwest

ST. PAUL, MINN., August 29, 1910.

There is at present a decided dearth of news in relation to new construction. Many projects which involve the purchase of machinery are known to be under consideration, but in the absence of authoritative information no details of these can be given out. Salesmen for the leading machinery houses meet with the same difficulty in attempting to open negotiations for sales, being told that the plans have not yet been fully decided upon. With so many responsible officials absent in turn upon vacation trips it seems to be impossible to get enough together in any industrial corporation at one time to talk over any matter involving more than routine business. In this, however, there is also a deliberate policy of delay. To some extent the commercial situation of the country just now is rather disquieting, and among financiers of the Northwest there is a disposition to go a little slow with investments of all kinds.

In connection with the machinery displays this year at the Minnesota State Fair, there will be an innovation in the shape of an exhibit of iron ore, mining and handling methods made by the Oliver Iron Mining Company, Duluth. Officials of the company, including President W. J. Olcott and Major John U. Sebenius of the engineering department, are taking a personal interest in the matter.

The affairs of the Northwestern Tool & Machinery Company, Minneapolis, which went into bankruptcy some time ago, are now being wound up, the machinery and other stock having been disposed of at private sale. A settlement with creditors will shortly be effected.

The plant of the Northern Heating & Electric Company, St. Paul, has passed under the control of H. M. Byllesby & Co., Chicago, Ill., and will be developed along the lines

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that have recently been followed by that concern with reference to other Northwestern properties.

C. C. Crabtree, Rapid City, S. D., has organized a company for the establishment of a crushing and gypsum manufacturing plant of 4000 bbls. daily capacity. Engineers have been engaged to prepare the plans.

The Superior Iron Works of Duluth and Superior, Minn., will build a three-story brick and concrete addition, 40 x 120 ft., to its building on Grand avenue, near Third street, Duluth.

A new boiler house costing $50,000, which will be equipped with the most modern apparatus, is to be erected in connection with the city and county hospital in Minneapolis.

The Northwestern Metals Company, Helena, Mont., whose plans were mentioned some time ago, is now remodeling and adding to the old Steadman foundry at that place, converting it into a 100-ton electrolytic ore reduction plant. Most of the equipment has been ordered, but some apparatus will be needed up to the time of completing the installation, which is set for February 1.

The Northwestern Steam Boiler & Mfg. Company, Duluth, Minn., is building for the Duluth, Missabe & Northern Railroad a number of steel dump cars of a new type invented by Victor and S. A. Rakowsky of that city. An experimental car has been in service on the road for some time past, with very satisfactory results. The contract mentioned will be duplicated for the Duluth & Iron Range Railroad.

The Caledonia Mining Company, Wardner, Idaho, is preparing to build an ore reduction plant, for which thoroughly modern machinery will be required. Electric power is to be used.

The project for a pumping plant to serve the community will soon come to a head at Hettinger, N. D., where plans are now in course of preparation.

Pumping machinery will be purchased in the near future at Pine City, Minn., and a system of water works and sewage installed.

The Northern Pacific Railway is preparing to expend a large sum in the improvement of its terminals at Como, Wyo., including a car shop addition, 178 x 190 ft., and an extension of the boiler plant.

The U. S. Acetylene Lighting Company, Minneapolis, Minn., has been incorporated with $20,000 capital stock. The officers of the company are: A. M. Harrison, president; S. T. Johnson, secretary and treasurer; V. P. Roberts, vice-president.

The Cycloid Mfg. Company, Minneapolis, Minn., has been incorporated with $600,000 capital stock for the manufacture of farming implements. The incorporators are A. E. Paegel, W. P. Cockey and C. O. Furbush.

The North Pacific Coast

PORTLAND, ORE., August 26, 1910.

With respect to plant improvement, the machine shops and foundries on the north coast have made greater progress this summer than in any of the years preceding, and they are now in condition to handle the heavy run of business that is expected to set in before winter. For repair work, as well as new machinery building, the most modern facilities, such as oxyacetylene or electric welding outfits, have been installed. Provision is also being made for larger stocks than usual of spare parts, especially for sawmills, woodworking plants and mines, or ore reduction works, so that these can be promptly shipped when breakages occur.

In the line of current orders, the Alaskan trade still plays a prominent part, and there is some buying for export to Australasia and the Orient. The local demand covers a great variety of equipment of a miscellaneous character, with considerable marine work.

A large steam dredger for service in the Hawaiian Islands is being built for the Standard-American Dredging Company by the St. Johns Shipbuilding Company, Portland, Ore. The machinery for operating it is to be installed at Honolulu.

The Oregon Foundry, Portland, Ore., is putting on the market a loader for lumber and similar material, which is driven by a direct connected electric motor, making a compact, quick acting and economical unit.

The chisel tooth saws manufactured by R. Hoe & Co., New York City, are being handled at Seattle, Wash., by the Puget Sound Machinery Depot, which has found them in good demand.

G. F. Nelson, Seattle, Wash., has been elected vice-president of a company which is being organized there to establish a plant for the manufacture of graphite. The style under which it will operate has not yet been decided.

The Willapacific Power & Water Company has been organized at Willapacific, Wash., by Chas. E. Miller, J. F. Wilson and Chas. McCauley to build a hydroelectric power and pumping plant for service in that community. Mr. Miller is also interested in the Pacific Wood Pulp Mills, which has just been incorporated there, and other industrial enterprises for which electric power will be furnished.

The Pacific Light & Power Company, Walla Walla, Wash., which recently secured control of a number of electric power, lighting and traction properties, is preparing to make large expenditures for improving and enlarging the various plants. The purchase of considerable machinery will be involved as the company's plans are matured.

It is reported from Vancouver, B. C., that plans are now being made by the Imperial Car, Shipbuilding and Drydock Company, Ltd., recently organized there, for a pressed steel car building plant, dry dock and shipbuilding yards.

The Zimmerman-Wells-Brown Company, Portland, Ore., has the agency for some of the best standard lines of Eastern built power and pumping machinery, including the Kewanee Boiler Company's boilers, Goulds Mfg. Company's power pumps, Bates Machine Company's heaters and engines, Gardner Governor Company's air compressors, pumps and governors, and Houston, Stanwood & Gamble Company's slide valve engines, which are used largely in sawmill work. The exhaust fans, blowers and forge equipments of the Buffalo Forge Company are also handled by this concern, together with other machinery.

As the result of a recent visit from fire the plant of the Coquille River Electric Company, Coquille, Ore., will need to be rebuilt, and the former capacity of 15 kw. is to be considerably extended, as Myrtle Point, Norway and other communities are now included in the company's system. The generating unit which has been operated consisted of a General Electric generator driven by an Atlas engine.

The construction of a municipal water works system has been decided upon at Okanogan, Wash.

Steel castings from the foundry of the Columbia Steel Company, Portland, Ore., have been in increasing demand this season along the North Coast. Users find them very dependable in quality, and many who formerly ordered at a distance are now specifying them.

The Southwest

KANSAS CITY, MO., August 29, 1910.

From different parts of the Southwest come encouraging reports of the prospects for fall trade, and at a few of the leading centers of distribution there has recently been buying for the account of industrial enterprises, reclamation projects, &c. Some of the contracts that are now being closed represent negotiations which have been long pending, but an appreciable share of the purchasing is due to the success attending the efforts of local commercial organizations, as heretofore mentioned, to secure new manufacturing plants for their several communities. With the arrival of cooler weather the campaign for industrial plants will be pushed vigorously, and developments of interest to machinery houses may be looked for throughout the autumn months. Meanwhile, in the judgment of traveling salesmen who are once more canvassing the territory, there will be a gradual improvement in current business until all lines are again very active.

Machinery for a pumping plant will probably be required by November 1 at Paris, Ark., where plans for the construction of water works are under consideration. A large expenditure for the purpose is contemplated.

Through the efforts of the Commercial Club at Tulsa, Okla., arrangements are reported to have been made for the erection there of boiler works and a structural fabricating plant by the Robison Boiler & Mfg. Company. Those identified with this company are also said to be interested at Canton, Ohio, but it can probably be best addressed in care of the secretary of the organization mentioned.

The Webb City & Centerville Foundry & Machine Works, Webb City, Mo., is offering roll shells of chilled semi-steel, which show excellent results in service and have demonstrated their wearing qualities very thoroughly in competitive tests.

Development work is about to be extensively entered upon by the Commercial Mining Company, Prescott, Ariz., which will require the purchase at intervals of considerable machinery. The shaft has already been sunk 200 ft.

The contract for an elevated steel tank at Wilson, Kan., has been awarded the Chicago Bridge & Iron Works, Chicago, Ill.

The Mosher Machine & Foundry Company, Dallas, Texas, is making a specialty of structural iron for building purposes, and some enlargement of its fabricating plant will

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probably be necessitated before spring. The outlook for future trade is excellent.

The Copper Creek Mining Company is now having shipped to its property from the railroad station at Winkleman, Ariz., the material for two 75-ton furnaces, and it is the intention, a little later on, to build a converter plant of 150 tons capacity. A feature of operating economy is to be the installation of a battery of boilers utilizing the waste heat from the furnaces, the fuel for which will be oil. Other improvements are also under way or contemplated, and considerable new equipment will be required in the course of the next few months.

The Gatesville Light & Power Company has been organized at Gatesville, Texas, to establish an electric power plant for public service.

The American Wells Works Company is carrying in stock at Dallas, Texas, for immediate shipment, a very complete line of pumping and well-drilling machinery, including gasoline engines and air compressors.

The directors of the Board of Trade, Fort Worth, Texas, are planning a vigorous campaign for promoting the industrial growth of that city, including the location there of new manufacturing plants.

The Dallas Electric Light & Power Company, Dallas, Texas, which has been making improvements in its plant, is offering for sale a 900-hp. Corliss engine, which was recently displaced by other equipment.

The Casa Grande Land, Power & Development Company, Casa Grande, Ariz., will install a power and water distribution system for irrigation purposes. The equipment, which has been principally ordered, will consist of oil burning furnaces, marine boilers, steam turbines and centrifugal pumps, making it one of the most modern plants of its kind in the country. The president and chief engineer recently visited the East for the purpose of selecting the machinery.

Sealed bids will be received until September 9 at the office of W. S. Shannon, city clerk, Durant, Okla., for furnishing material and work connected with the construction of a filtration plant and an electric light plant and lines for the city of Durant.

Broken Arrow, Okla., has plans prepared for the construction of a water works system, including wells, tower and tank, steam plant and power house, to cost $30,000.

The Hazen Power & Light Company, Hazen, Ark., incorporated with $25,000 capital stock, will begin work at once on the construction of a plant to furnish electric power for industrial purposes. The company will also manufacture ice and furnish power for lighting purposes to the surrounding country.

The city of Terrell, Texas, will expend $10,000 for improvements to its light and water plants.

Charles Ilfield Company, Las Vegas, N. M., is considering the erection of a warehouse and cold storage plant at Albuquerque, N. M.

Charles H. Halt and others of Denver, Colo., have completed plans for establishing a $500,000 manufacturing plant in San Antonio, Texas. Five factories, under one management, will be erected. One will be a foundry and structural steel department, one for the manufacture of wire goods, one for tinware and similar goods. Mr. Halt and his associates are interested in wire fabric manufacturing plants at Denver, Colo.; Seattle, Wash., and Enid, Okla.

A State charter has been granted to the Duncan Electric Light & Ice Company, Duncan, Okla.; capital stock, $75,000. The directors are E. S. Bessey and M. M. Dunaway of Oklahoma City, and John C. Keys of Cleveland, Ohio.

The Farther Central West

OMAHA, NEB., August 29, 1910.

A matter now attracting considerable attention here, and one that seems likely to have an important bearing upon the future of the machinery market in this section, is the project of the Commercial Club of Omaha for an annual industrial exhibition, which will adequately represent the manufacturing and commercial interests of the city and State. Owing to the progress that has been made during the present decade in the industrial development of the Missouri Valley districts, as well as some of those lying farther West, there is opportunity for a very comprehensive display.

Sales of machinery continue light. Equipment for power and pumping plants, air compressors, hoists, electric railway material and contractors' outfits are the most active in the list, with a scattering demand for metal and woodworking tools, mill and factory appliances, heating and ventilating apparatus, &c.

The purchase of an additional pumping engine is under discussion by the city officials at Davenport, Iowa, and an appropriation for the purpose will probably be made this fall. The crank and flywheel type of engine, with Corliss valve gear, is most likely to be selected for the service.

The Sac City Electric Company, Sac City, Iowa, which has a power plant of 200 hp., will probably add to its boiler capacity in order to provide for heating the business district.

It is proposed to construct a municipal pumping plant and water works system at Ellsworth, Iowa, to cost about $65,000.

A modern high duty pumping plant will probably be installed next spring at Clinton, Iowa, where the authorities are having plans prepared.

J. Frank Kinney and W. E. Kinney, Shelby, Neb., and Wm. E. Pratt, Lincoln, Neb., are officers of a new company which is being organized to establish a large plant for the manufacture of graphite in the vicinity of Seattle Wash.

The Iowa Engineering Company, Clinton, Iowa, has prepared plans for a power and pumping station at Pella, Iowa, the equipment of which will include a battery of three boilers, with heater and feed pumps; two engine driven generating sets for alternating current, two centrifugal pumps and motors for driving them, with other auxiliary apparatus. Further information can be obtained from the company or from the city clerk of Pella, by whom bids will be taken until September 6.

The power equipment of the Cheyenne Light, Fuel & Power Company, Cheyenne, Wyo., which now consists of engine driven generators with an aggregate output of 750 kw., will probably be enlarged in order to provide more current for centrifugal pumping units used in irrigation projects of the vicinity, which are operated by electric motors.

Equipment for water works will be required in the near future at Cheyenne Wells, Colo., where a municipal system has been decided upon.

The Omaha Commercial Club has under consideration propositions affecting the location here of a number of industrial plants, one of which is to be taken up by the Executive Committee at its next meeting involves the building of a large factory for the manufacture of pianos.

Johns & Oliver, Central City, Colo., have leased what is known as the Mitchell mine and are erecting a shaft house. An air compressor, hoist, &c., are to be put in operation and other machinery purchased as the work progresses.

Authorization for the purchase of two new boilers of 350 hp. each for the city power and pumping plant at Hastings, Neb., has been refused, but the matter will be taken up again in the fall, as the equipment is needed to meet the requirements of the service.

The Navarrio Mining & Tunnel Company has been organized, with C. E. Smith, Empire, Colo., as manager, and is beginning extensive development work, which will lead to the purchase in the near future of some operating machinery.

The Hawkeye Pearl Button Company, Oskaloosa, Iowa, will erect a new plant to employ about 100 men.

The city of Mulvane, Kan., will expend $30,000 for the construction of a water works system. Robert P. Scyer, city clerk.

The Quam Hydraulic Vacuum Cleaner Company, Waterloo, Iowa, incorporated with $10,000 capital stock for the manufacture of hydraulic and electric vacuum cleaners, will occupy leased quarters, for which the necessary equipment has already been purchased and installed.

The Spaulding Mfg. Company, Grinnell, Iowa, manufacturer of vehicles and motor cars, is erecting a new factory building, 74 x 218 ft. All equipment to be installed has been contracted for.

The City Council of Columbus Junction, Iowa, is preparing to establish an electric light plant.

Government Purchases

WASHINGTON, D. C., August 30, 1910.

The Paymaster General, Navy Department, Washington, will open bids September 6, under schedule 2824, for appliances for use with oxyacetylene welding plant, and one Herbert automatic file testing and indicating machine. Under schedule 2826 for two turbo generating sets, one motor generating set and one switchboard.

Major G. D. Deshon, medical corps quartermaster, Hot Springs, Ark., will open bids September 10 for furnishing and installing one triplex motor driven pump and two motors, one A. C. and one D. C.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 23, under class 41, for six complete sets propelling machinery for 20-ft. motor dories, as follows: Bidder 6, the Atlantic Company, Amesbury, Mass., $200.30; 23, the Camden Anchor Rockland Machine Company, Camden, N. J., $170; 33, the Eagle Company, Newark, N. J., $145; 37, the Fairbanks Company, Washington, D. C., $150; 38, the Ferro Machine & Foundry Company, Cleveland, Ohio, $175; 41, the Fulton Mfg. Company, Erie, Pa., $175.59; 66, the Lackawanna Mfg. Company, Newburgh, N. Y., $130.

For Tariff Revision Piecemeal

In a letter to William B. McKinley, chairman of the Republican Congressional Committee, which is intended for use as a campaign document, President Taft expresses his expectation of securing further revision of the tariff by amending one schedule at a time. That portion of the letter which bears upon this matter, in connection with the Payne tariff act, is as follows:

The Criticisms of the Payne Bill

The bill has been criticised for certain of its rates and schedules. Some of the criticisms are just and some are wide of the mark and most unjust.

The truth is that under the old protective idea the only purpose was to make the tariff high enough to protect the home industry. The excess of the tariff over the difference in the cost of production here and abroad was not regarded as objectionable because it was supposed that competition between those who enjoyed the high protection would keep the price for the consumer down to what was reasonable for the manufacturer. The evil of excessive tariff rates, however, showed itself in the temptation of manufacturers to combine and suppress competition, and then to maintain the prices so as to take advantage of the excess of the tariff rate over the difference between the cost of production abroad and here.

The Payne tariff bill is the first bill passed by the Republican party in which the necessity for reducing rates to avoid this evil has been recognized, and it is therefore a decided step in the right direction and it ought to be accepted as such. On the whole, it was a downward revision, particularly on articles of necessity and on raw materials. The actual figures on the first year's operation of the law demonstrate this. It must also be remembered that the tariff rates in the new law on imported liquors, wines and silks were increased substantially over the Dingley rates, because these were luxuries and it was intended to increase the revenue.

The charge that the present tariff is responsible for the increase in the prices of necessities is demonstrably false, because the high prices, with very few exceptions, affect articles in the tariff upon which there was no increase in rates or in respect to which there was a substantial reduction.

The Tariff Board

Perhaps more important than any one feature of the operative part of the tariff law is that section which enables the Executive to appoint a tariff commission or board to secure the needed information for the proper amendment and perfection of the law. The difficulty in fixing the proper tariff rates in accord with the principle stated in the Republican platform is in securing reliable evidence as to the difference between the cost of production at home and the cost of production abroad. The bias of the manufacturer seeking protection and of the importer opposing it weakens the weight of their testimony. Moreover, when we understand that the cost of production differs in one country abroad from that in another, and that it changes from year to year and from month to month, we must realize that the precise difference in cost of production sought for is not capable of definite ascertainment, and that all that even the most scientific person can do in his investigation is, after consideration of many facts which he learns, to exercise his best judgment in reaching a conclusion.

The commission, however, already selected and at work, is a commission of disinterested persons who will ascertain the facts, not in a formal hearing by examination and cross examination of witnesses, but by the kind of investigation that statisticians and scientific investigators use. When the commission completes its work, either on the entire tariff or on any of the schedules in respect to which issue has arisen, and the work of the commission shows that the present tariff is wrong and should be changed, I expect to bring the matter to the attention of the Congress with a view to its amendment of the tariff in that particular. Of course this will be impracticable unless Congress itself shall adopt the parliamentary rule, as I hope it will, that a bill to amend one schedule of the tariff may not be subject to a motion to amend by adding changes in other schedules.

It will thus be possible to take up a single schedule with respect to which it is probable that a great majority of each House will be unprejudiced, to admit the evidence, and to reach a fair conclusion, and this method will tend to avoid disturbing business conditions. For these reasons it seems to me that all Republicans—conservative, progressive and radical—may well abide the situation with respect to the tariff until evidence now being accumulated shall justify changes in the rates; and that it is much better for them to vote for Republicans than to help create a Democratic majority which would be utterly at war with the protective principle, and therefore would have no use for the findings of the tariff commission, as we may certainly infer from the solid Democratic vote in the present Congress against the necessary appropriation for the commission's work.

The Harriman Rotary Engine

A new type of rotary engine has been developed from the inventions and patents of J. Emery Harrington, Jr., 53 State street, Boston, Mass., and the results of a test made at the Massachusetts Institute of Technology show a steam consumption of 31.02 lb. per brake horsepower-hour.

The rotor case of the engine contains a simple cylindrical rotor, eccentrically keyed to a straight shaft. In operation a rocking abutment between the inlet and the exhaust ports is held in place by the pressure of the working fluid to prevent short circuiting. The projecting part of the rotor contains a simple metallic packing strip, and the ends of the rotor contain packing rings which bear against the side covers. During a portion of the time the rotor is under direct steam pressure and during the balance of the revolution the steam is cut off and permitted to expand.

The engine tested had a rotor 9.4 in. in diameter and 8 in. long, revolving in a case 12 in. in diameter. The shaft in the rotor was 4 in. in diameter, with no angles or cranks, and ran in bearings 13 in. long and 3¼ in. in diameter. These bearings have an oil storage capacity of 1 gal, and the lubricant is fed to the shaft by wicks and then returns to the well. The test was run in the usual manner and the results showed that when running at a speed of approximately 500 rev. per min. 25.72 hp. was developed, as measured by a water brake, and the steam consumption was 31.02 lb. per brake horsepower-hour.

Automatic Cushioned Water Pressure Reducing Valve.—The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., has added an automatic cushion water pressure reducing valve to its line. In this valve the pressure to which it is desired to reduce the water is regulated by a spring, which is compressed to the desired tension by a plate on top of the valve. This spring acts on a piston attached to the main valve spindle and forces the valve open. The water on the high pressure side of the valve passes underneath this piston and through a port in the main valve spindle. When the pressure on the low pressure side reaches the spring setting the valve closes.

Trade Publications

Steam Traps.—Richard J. Flinn, West Roxbury, Mass. Circular. Calls attention to the Flinn differential trap for draining the water of condensation from steam pipes and coils, engine cylinders, receivers, jackets and separators, steam kettles, drying cylinders, &c. The action of this trap is independent of the temperature of the water handled and it will work equally well, it is said, at any pressure below its maximum. It is not affected by vibration or oscillation, which renders it adaptable for marine use, and has only three parts.

Electric Generators.—The Ideal Electric & Mfg. Company, Mansfield, Ohio. Bulletin No. 1051. Gives constructional details of a new line of revolving field alternators which this company has recently perfected, and shows also test curves and data on the performance of these machines under various service conditions. These machines are built in standard sizes up to and including 250 kva. in all standard voltages. A discussion and curves showing the influence of the power factor upon the efficiency, the heating characteristics, the exciting current and the power required to drive these machines are included. An illustrated description of the 100-kva. model was printed in *The Iron Age*, August 4, 1910.

Centrifugal Pumps.—The De Laval Steam Turbine Company, Trenton, N. J. Booklet entitled "High Efficiency of Centrifugal Pumps." Contains a number of charts and information regarding the testing of centrifugal pumps and how to interpret the charts giving the results of such tests. The relative importance of the various features of pump design and the adaptation of centrifugal pumps for all methods of driving and classes of service are discussed. The characteristic curves of a number of pumps are shown and the conditions for which each pump was designed are given to illustrate the accuracy with which these conditions were met by the designer. The illustrations show De Laval pumps adapted for delivering against heads varying from a few feet up to 1600 ft., while the capacity varies from those employed for feeding small boilers up to models delivering 30,000 gal. per minute.

Tin Roofing.—The American Sheet & Tin Plate Company, Frick Building, Pittsburgh, Pa. Pamphlet entitled "The Roof of Quality and Service." Treats of the advantages of a good tin roof as regards cost, service, repairs, protection against the elements and fire, weight, adaptability, application and appearance. The various styles of roofing tin made by this company are shown and described briefly. These include both terne plates and continuous rolls made from them.

Wire Straightening Machines and Riveters.—The F. B. Shuster Company, New Haven, Conn. Booklet. Size 3¼ x 6 in.; pages 24. Relates to the automatic wire straightening and cutting machine and the elastic blow riveters of this firm. A brief history of the process of making articles from wire is given and two of the wire machines of the company are shown. The riveters are described in a general way and illustrations of three of the types manufactured are employed to supplement the text.

Metallic Cement.—H. W. Johns-Manville Company, 100 William street, New York City. Mailing card. Devoted to the J-M Leak-No metallic cement for making permanent repairs to all leaks in iron and steel articles. Some of its applications are to repair blistered boiler plates, make cracks, spongy spots and sand and blow holes homogeneous with the rest of the metal, and stop leaks against any pressure of oil, steam, gas, ammonia, brine or water.

Nuts.—The Milton Mfg. Company, Milton, Pa. Pamphlet. Calls attention to a line of nuts for use on automobiles of all kinds from light runabouts to heavy touring cars and those used for making speed records. These nuts are made either soft or case hardened and to conform to the A. L. A. M. standard sizes.

Steel Car Paint.—The Joseph Dixon Crucible Company, Jersey City, N. J. Booklet. Points out the merits of the Dixon paint for steel cars and illustrates a number of types of these cars upon which it has been used with good results. Color chips showing the four colors in which this paint is made are also included.

Magnetic Separators.—Dings Electro-Magnetic Separator Company, Milwaukee, Wis. Folder. Pertains to a line of magnetic separators for brass foundries and metal refining works, where they are employed to remove iron from brass and copper turnings, borings, punchings, &c. The construction is such that a large primary magnet body and a series of secondary induced magnets mounted upon a rotating disk act on the material. Among the special advantages claimed for this type of construction are that the stock is brought under a powerful magnetic field at two different points, which is equal to two separate treatments with an ordinary separator and no opportunity for mechanical entanglement is afforded.

Automatic Wood Screw Machinery.—Amstutz, Levin & Co., Rorschach, Switzerland; Ed. Brand, 472 Moss Lane East, Manchester, England, sole sales agent. Catalogue W-50. Deals with a line of automatic high-speed wood screw machinery which includes heading presses, head turning and slotting machines and thread cutting machines. The range covered by these machines is from 0.053 in. in diameter and 1¼ in. long to 0.433 in. in diameter and 6 in. long, while thread cutters for larger sizes can be built to order. In operation these tools are entirely automatic and they are designed to give a maximum output with a minimum of waste.

Advertising Service.—George H. Gibson Company, Tribune Building, New York City. Pamphlet entitled "How to Reduce the Expense of Selling Machinery." Describes improved methods in promoting the sale of machinery by educational work and advertising. The several kinds of advertising literature intended to arouse the interest of consulting engineers, owners and operating engineers are discussed as well as the channels through which it may be distributed. Hints on the preparation of advertising literature are given that will be of value to any one responsible for promoting the sales of products of an engineering or mechanical nature, and a brief statement of what this company is prepared to do for clients completes the pamphlet.

Blowers and Vertical Engines.—American Blower Company, Detroit, Mich. Two bulletins. No. 284 gives general description and specifications of the Sirocco fans and blowers. The different types of fans are illustrated and outline drawings show the different standard arrangements and types. Tables of dimensions of the various standard types complete the bulletin. No. 288, superseding No. 232, is devoted to the ABC vertical self-oiling engine. Complete and detailed illustrations supplement the description of the engine and a number of views show the engine performing various kinds of work.

Woodworking Tools.—Wessman Tool Company, Rockford, Ill. Catalogue. Size 6 x 9 in.; pages 56. Calls attention to a line of hollow chisels and wood boring tools. These include hollow mortising chisels, bits used in connection with them, and a number of bits for special uses. All of these different tools are illustrated and brief specifications are included.

Electrical Appliances.—General Electric Company, Schenectady, N. Y. Four bulletins. No. 4718 covers all the apparatus for a complete series incandescent lighting system. No. 4750 treats of standard couplings for coupling electric apparatus together or to other machinery. The different types described are illustrated and connection diagrams are appended. No. 4752, superseding No. 4620, relates to rectifier sets, luminous arc lamps and all auxiliary apparatus for complete series luminous arc rectifier systems. No. 4760, superseding No. 4643, deals with direct current instruments for switchboard use.

Welding.—Goldschmidt Thermit Company, 90 West street, New York City. Pamphlet entitled "Thermit Welding of Castings and Forgings." Deals with the use of thermit in making general repairs to castings and forgings. Illustrations and descriptions are included of the repair of electric motor casings, street railroad car trucks, armature shafts and flaw and shrinkage holes in castings.

High Pressure Blowers.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 140. Refers to the use of the Sturtevant high pressure blowers for handling air or gas at any pressure below 10 lb. per square inch for supplying air blasts for cupolas, forge fires, smelting, hardening, tempering and annealing furnaces and pneumatic tube systems. Space is given to the construction and operation of these blowers, followed by instructions for installing them and the report of a test made. The blowers and their various parts are illustrated and brief tables of dimensions are appended.

The Canton Sheet Steel Company.—C. A. Irwin, secretary and general manager of the Canton Sheet Steel Company, Canton, Ohio, states that it is expected the new works will be ready for operation about November 1. The main building is all steel, 135 x 300 ft., and there are two smaller buildings. The company is installing a number of mills and work on the plant was started last May. W. W. Irwin is president; H. S. Renkert, vice-president; J. E. Graham, second vice-president, and C. A. Irwin, secretary, treasurer and general manager.

The Lake Superior Mining Institute journeyed to Gary, Ind., on the occasion of its annual meeting August 25. An election was held in the evening, resulting in the choice of the following to serve for the ensuing year: W. J. Richards, president; A. J. Yungbluth (re-elected), secretary; E. W. Hopkins (re-elected), treasurer. The members had spent that day in Chicago, visiting places of interest, including the plant of the Sullivan Machinery Company and the warehouse of Joseph T. Ryerson & Son. The following day they inspected the Indiana Steel Company's plant at Gary.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Assumption of Risk of Injury.—A steel mill foreman assumed the risk of being injured by being caught by a set screw on a revolving shaft, while leaning against the shaft, where he knew of its presence and had worked about the shaft for more than two years. (New York Supreme Court, Appellate Division, Fourth Department, Larsen *vs.* Lackawanna Steel Company, 123 New York Supplement 1077.)

Remedy of Employee on Wrongful Discharge.—An employee wrongfully discharged before the expiration of the period for which he was engaged can either regard the contract as broken and sue at once for his damages, or he can hold himself ready to work under the agreement and at its expiration sue for the agreed salary, less a reasonable deduction of the amount that he could have earned elsewhere. (Massachusetts Supreme Judicial Court, Allen *vs.* Chicago Pneumatic Tool Company, 91 Northeastern Reporter 887.)

Liability for Injury to Employee.—The mere fact that an employee was injured while performing his work does not establish his employer's liability therefor, it being necessary to establish negligence under some particular provision of the employers' liability act. A workman directed to repair a switch cannot base his employer's liability for injury received, while doing the work, on the defect he was repairing. (Alabama Supreme Court, Walton *vs.* Tennessee Coal, Iron & Railroad Company, 52 Southern Reporter 328.)

Liability of Employer for Acts of Employee.—An employer is not liable for injuries intentionally inflicted by an employee, unless they were inflicted while the employee was acting within the scope of his employment. (Alabama Supreme Court, Johnson *vs.* Alabama Fuel & Iron Company, 52 Southern Reporter 312.)

Liability of Employer for Defects in Construction Work.—In the construction of a steel bridge a traveling derrick was operated along rails laid on wooden ties, and as the work progressed the ties and rails were relaid in front of the derrick. Held that the construction company is not liable for the death of an employee caused by his stepping upon an end of a tie from which the spikes and rails had been removed, since the duty of an employer to furnish a safe place of work for his employees does not apply to conditions arising in the course of construction. (New York Supreme Court, Appellate Division, First Department, Brady *vs.* Pennsylvania Steel Company, 123 New York Supplement 905.)

Employee's Failure to Use Safety Appliance Bars Recovery for Injury.—A steel company is not liable for injury to an employee caused by the capsizing of a locomotive crane while assisting in moving a heavy steel casting, where the employees were furnished a device to prevent such accidents but failed to use it. (New York Court of Appeals, Dowdell *vs.* Lackawanna Steel Company, 91 Northeastern Reporter 789.)

Employer's Duty Not Deputable—Assumption of Risk by Employee.—An employer cannot avoid his duty to use ordinary care to furnish reasonably safe appliances for the performance of work by delegating it to another. An employee need not inspect tools furnished him, and does not assume the risk of injury through their defective condition unless he knows of the defects or they are obvious. This rule applies to a workman holding a steel cutter used in cutting the heads of rivets while another workman strikes it with a maul. (Texas Court of Civil Appeals, Buchanan & Gilder *vs.* Blanchard, 127 Southwestern Reporter 1153.)

Duty of Employer to Provide Safe Exit from Place of Work.—An employer being bound to furnish a safe exit from the employee's place of work, as well as a safe place of work, is liable for injury to a workman caused by slipping upon scrap iron lying on the floor of the room through which he was passing. (St. Louis Court of Appeals, Strobel *vs.* Gerst Brothers Mfg. Company, 127 Southwestern Reporter 421.)

Proof Required Respecting Emery Wheel Accident.—In a suit by an employee to recover for personal injury caused by the breaking of an emery wheel, based on alleged negligence of the employer in failing to provide flanges for use in connection with the wheel, it was incumbent upon the employee to show not only that improper appliances were furnished, but that the accident was caused by the particular defects pointed out, it being insufficient to merely show that the accident might have resulted from such defects. (United States Circuit Court, District of Rhole Island, Beardsley *vs.* Howard & Bullough American Machine Company, 176 Federal Reporter 619.)

Liability for Injury to Employee.—An employer is not liable for injury to the operator of a reamer, caused by a slipping of a board of the platform on which he stood, if use of the platform was prohibited by the employer and the employee was taught to operate the reamer from the floor. A workman who places a finger in a nipple or piece of pipe to be reamed, the piece of pipe being grasped in a vise and so fixed as to approach revolving knives on a foot lever being pressed, assumes the risk of injury resulting from a board slipping in the platform on which he is standing, causing his foot to press the foot lever, whereby his finger is brought in contact with the knives. (Maryland Court of Appeals, McGee *vs.* Cuyler, 75 Atlantic Reporter 970.)

Effect of Concurrent Negligence.—An employer cannot defeat liability for an injury resulting directly from his negligence by showing concurrent negligence of a third person. (Alabama Supreme Court, Alibama Steel & Wire Company *vs.* Thompson, 52 Southern Reporter 75.)

Liability for Death of Employee.—An iron manufacturing company is not liable for the death of a workman who, being employed to repair a furnace, rode a tramcar to the top and was dumped into the furnace, where the company had provided another way for employees to ascend, there was no defect in the appliances, stop blocks could have been so placed as to have prevented the accident, and the engine was operated by an unauthorized person. (Alabama Supreme Court, Tobler *vs.* Pioneer Mining & Mfg. Company, 52 Southern Reporter 86.)

Risk of Injury Assumed by Employee.—One employed in a foundry to hook and unhook chains used in connection with a crane in moving objects, assumed the risk of being injured by a movement of the crane without a signal, where he knew that no signal was customary and had worked several months without protesting against his employer's failure to fix a rule governing operation of the crane. (Wisconsin Supreme Court, Kraczek *vs.* Falk Company, 126 Northwestern Reporter 30.)

Partnership's Right to Property in Partner's Name.—Property standing in the name of a partner may be partnership property, though it was not acquired with firm funds, since it may have been a part of the capital of the firm contributed by such partner to the firm assets. (Michigan Supreme Court, Cleveland-Cliffs Iron Company *vs.* Hull, 123 Northwestern Reporter 891.)

Electrical Equipment Orders Small.—It is stated by the Boston *News Bureau* that two-thirds of the General Electric Company's enormous sales since the beginning of the fiscal year January 1 last have been small orders. In the old days $500,000 and $1,000,000 orders were not infrequent and were depended upon to hold up the total of a year's sales. To-day a $250,000 order is a rarity. The average value of orders booked in the 11 months to December 31 last was slightly more than $200. This current year the average value per order promises to go below $175, while the total number of orders received will probably exceed 350,000. This small order business is positive proof that the electrical industry has now reached a point of permanency where a broad consumptive field for its products is constantly assured. In the coming days when security markets permit of flotation of big power and street railroad projects or consolidations, large $1,000,000 and $2,000,000 orders will again crop out.

The Bayonne Steel Casting Company, Bayonne, N. J., an affiliated company of the Reading Steel Casting Company, Reading, Pa., ran its first heat of steel August 20. A record in the construction of a complete steel casting plant has been made by this company, in that almost exactly three months from the date on which possession of the property was taken, May 16, a heat of steel was made. Orders have already been taken which will be sufficient to run the plant, which is claimed to be the largest of its kind in the country, at full capacity for several months. A description of the new plant was printed in *The Iron Age* of May 12.

The Advisory Board of the Amalgamated Association, in addition to calling off the strikes at the sheet and tin mill plants of the American Sheet & Tin Plate Company, La Belle Iron Works and Youngstown Sheet & Tube Company, has also called off the strikes at the plants of the Stark Rolling Mill Company, Canton, Ohio, and Clark Rolling Mill Company, Massillon, Ohio.

Automobile Mortgages

President Benjamin Briscoe of the United States Motor Company recently wrote to 24,000 bankers in the United States, asking them to furnish him with the number of people in their vicinity who had mortgaged homes or who had borrowed money to purchase automobiles. Replies received from 4830 bankers state that there are 198,216 automobiles in their cities and towns. Of this number only 1254 have been purchased by the placing of mortgages and only 7475 have borrowed money without mortgage to purchase automobiles.

With less than 1 per cent. of automobiles bought on mortgages and less than 4 per cent. purchased with borrowed money, recent claims of alarmists are conclusively proved to be practically without any foundation whatever. The thorough investigation by the United States Motor Company has unquestionably exploded the irresponsible statements of a group of men who have endeavored to make the public believe that the automobile capital represented an economic waste. As a matter of fact, figures show the automobile business to be built upon as sound a foundation as that of any other industry.

Many of the letters are filled with optimistic statements, and there is probably no class of business men in the country who are in a better position to throw light on the future of the automobile industry, and in fact any business, than the bankers. These letters reveal the exact conditions in all sections of the country, and it is with considerable gratification that a big percentage of the letters speak in glowing terms of the various business purposes to which the automobile is applied.

It is surprising that so many so-called pleasure cars are used by physicians, contractors, real estate dealers, farmers, the bankers themselves and other business men. Reports show that hundreds of the bankers own cars, and they do not hesitate to say that they consider them helpful, not only in ways of recreation, but in business as well.

Many of the letters deal upon the usefulness of the automobile for farmers. The automobile has brought the farming sections closer to the cities and is making the boys contented with farm life. It is keeping many of the farmers' sons on the farm instead of leaving the farm for city life. The farmer can go to town with a load in a short time and get back and do a day's work. In the evening they use the car in taking their families to lectures, concerts or the theatre, and get home in time for a good night's sleep. It is the belief of many of the bankers in the rural sections that the automobile makes agricultural life worth living.

Pittsburgh Firm to Build Furnaces for Gary Sheet and Tin Mills.—The Forter-Miller Engineering Company, Hartje Building, Pittsburgh, has just secured a contract from the American Sheet & Tin Plate Company, Pittsburgh, for the erection of all the various furnaces required in its new sheet and tin plate plant at Gary, Ind. The contract is an important one, and includes nearly 60 furnaces of all types and sizes. Work is to be started at once, and it is expected the furnaces will be completed and ready for operation in about four months.

During the first seven months of this year nearly $1,500,000 in benefits has been paid by the relief departments of the Pennsylvania Railroad system to members unable to work and to families of members who died. In the month of July alone the sum of $162,337.04 was paid out in benefits, and since the relief departments for both the lines east and west of Pittsburgh and Erie were established the total sum of $28,820,337.24 has been paid out.

"Poaching Proprietors"

In several localities where strikes in foundries are now raging, says the *Bulletin* of the National Founders' Association, the proprietors are resorting to the antiquated policy of engaging molders and coremakers from the plants of their fellow manufacturers who may be conducting open or nonunion shops or themselves combating strikes. These proprietors will do well to bear in mind the sound advice given by President Henry A. Carpenter in his report to the last convention of this association. This advice was as follows:

"I desire to impress upon our members the fact that little or nothing will be gained permanently, when you are face to face with a strike, or when simply short of molders, by robbing the foundry of your neighbor and enticing his molders to come into your plant. There is no semblance of generalship in the pursuit of the policy of 'robbing Peter to pay Paul.' Molders have been taken from my own foundry under conditions such as these, and since I have been president of this association the very foundrymen who depleted my force have been the first to complain because some other proprietor had in turn replenished his supply from their plant."

The Mix Athletic Field for Dodge Employees.—In keeping with its progress in welfare work, the Dodge Mfg. Company has just opened to employees of its plant at Mishawaka, Ind., an athletic field fully equipped for tennis, croquet, quoits, bowling on the green and pitching horseshoes. As an honor to Melville W. Mix, president of the company, and father of the proposition, the field has been named after him by the Dodge Club, under whose direction it will be conducted. The ground measures 107 x 122 ft., and is located near the factory buildings and in a section of the city easily reached by Dodge men. The place is inclosed by a woven wire fence, by which its benefits can be exclusively enjoyed by the parties directly interested. Surrounding the field is a system of tungsten lights, affording facilities for indulging in the various sports after dark. Under shade trees comfortable lounging seats have been placed as a resting place for players and for the use of lookers-on.

Social Insurance Payments in Germany.—Dr. William H. Tolman, Director of the American Museum of Safety, New York, makes the following statement regarding the workings of the German Governmental system of workmen's insurance: "From the latest available statistics, furnished me by Dr. Zacher, Director in the Imperial Bureau of Statistics, I learned that from 1885 to January 1, 1909, the German employers have paid $1,100,000,000; the workmen $981,000,000, and the empire, in special payments to the invalidity department, $146,000,000. To these sums should be added $231,000,000, receipts from interest and other incomes. The grand total receipts for social insurance amount to $2,449,000,000. The insured workmen have received in compensation $1,740,000,000, of which $980,000,000 was paid for care during sickness and restoration to health; accordingly, while the workmen have paid 3.9 billion marks, they have received in compensation 3 billion marks more than they themselves have paid."

The Sanford-Day Iron Works, Knoxville, Tenn., has about completed extensive improvements to its blacksmith, machine and carbuilding shops. The company will build an addition to its foundry, making it 100 ft. longer and about 60 ft. wide. This new department will be devoted entirely to the manufacture of car wheels and will be equipped with the usual pits, trolley system, &c.

Personal

The directors of the Railway Steel Spring Company have elected W. H. Marshall, president of the American Locomotive Company, as a director and a member of the Executive Committee, to succeed William H. Silverthorn, deceased. They also elected F. F. Fitzpatrick a member of the Executive Committee. No action was taken on the election of a new president at the meeting.

Charles C. Cluff has been appointed manager of sales for the New York district of the Carnegie Steel Company, Illinois Steel Company and Tennessee Coal, Iron & Railroad Company, succeeding Charles W. Baker, who has resigned. Richard Wayland-Smith succeeds Mr. Cluff as assistant manager of sales. These appointments are effective September 1.

David W. Pye, vice-president of the Safety Car Heating & Lighting Company, New York, has resigned to become president of the United States Heating & Lighting Company. With his retirement the Safety Company announces the appointment of John J. Mallay as general purchasing and supply agent, with charge of all departments heretofore under Mr. Pye.

Jonathan E. Jones, secretary-treasurer of the Alan Wood Iron & Steel Company, Philadelphia, Pa., is spending a month's vacation in the Adirondacks.

J. N. Chester, formerly associated with the Epping-Carpenter Company, Pittsburgh, has resigned, and he and Thomas Fleming, Jr., for the past three years chief of designs on water works and sewerage in the State Health Department of Pennsylvania, have formed a partnership as consulting engineers, with headquarters at Pittsburgh.

Fred K. Maus has been placed in charge of the Scully Steel & Iron Company's downtown office, which is in room 634, First National Bank Building, corner Monroe and Dearborn streets, Chicago. A regular automobile service for the benefit of the company's customers will be maintained between this office and its general offices at Twenty-fourth street and Ashland avenue.

J. E. Johnson, Jr., whose resignation as general superintendent of the Thomas Division of the Republic Iron & Steel Company was recently announced, leaves that company to become manager of the Ashland plant of the Lake Superior Iron & Chemical Company at Ashland, Wis. During Mr. Johnson's superintendency of the Thomas furnaces all their previous records for coke consumption and pig iron output were broken and new records for the Birmingham district were established.

C. H. Conover, vice-president of Hibbard, Spencer, Bartlett & Co., Chicago, who has been in Europe since early in July, is expected to return about October 1.

George R. Le Baron retires September 1 from the El Paso Foundry & Machine Company, El Paso, Texas. For the last three years he has managed the supply business of the company and held the office of secretary. He is going into the real estate and insurance business in the same city, taking over Mr. Leavell's interest in the firm of Broddus & Leavell, and the firm name from September 1 will be Broddus & Le Baron.

F. W. Jaeger, manager of the American office of Alfred H. Schutte, 90 West street, New York, who has been spending six weeks visiting the European offices of the company he represents, has returned to this country.

An employee of the Crucible Steel Company of America, Pittsburgh, who had occupied a responsible position for some years, has been arrested, charged with frauds against that concern in the sale of iron and steel scrap. He is now under heavy bail to answer these charges, and the amount involved is said to be over $150,000.

Suggestions in Ordering Wire Cloth

The Buffalo Wire Works Company, 316-320 Terrace, Buffalo, N. Y., calls attention to the fact that numerous manufacturing consumers and other purchasers of wire cloth are not sufficiently familiar with this class of product to give proper specifications with inquiries or orders. Correspondence is then necessary, which frequently causes annoying delay.

The company has, therefore, issued a card which gives practical suggestions. An illustration shows the exact sizes of wire as used in iron and steel wire cloth, both in decimal parts of an inch and, according to the Washburn & Moen gauge, which is the standard for this product. Other illustrations are given for the purpose of indicating how the mesh and space are to be determined. The mesh in wire cloth denotes the number of openings per lineal inch, measuring from center to center of the wire. Space denotes the actual size of openings or space between the wires. The number of lineal feet is an important factor in ordering at all times. The width is an item often forgotten, and should be plainly mentioned. In stating the gauge of wire wanted, it may be advisable to mention the decimal showing the thickness of the wire, which would then preclude any possibility of a mistake. The material should by no means be overlooked—that is, whether the cloth is to be of steel, iron, and whether galvanized or not, brass, copper, &c. It is further advisable to furnish samples when possible, or to state for what use the cloth is intended.

Idle Cars Diminishing.—On August 17, according to the weekly bulletin of the American Railway Association the net surplus of idle cars on the lines of the United States and Canada stood at 73,679, a decrease of 29,102, or about 28.3 per cent., from two weeks before. Decreases were not confined to any one section of the country, but the general awakening in freight activity which became marked at the first of the month was continued. The Middle West reported the largest reduction in car surplus, the need for carriers shrinking the supply about 34 per cent. Box cars were particularly in demand. The decrease in the past month has brought the total far below the figures for the corresponding period of last year. It is believed that a shortage is inevitable, and the Committee on Relations Between Railroads has already warned shippers and the roads to expedite freight shipments as much as possible.

The Forged Steel Wheel Company's New Steel Plant.—The new steel plant of the Forged Steel Wheel Company, at Butler, Pa., will be ready for operation in a short time. It contains six 60-ton open hearth furnaces and a slabbing mill. The steel output will be finished on the slabbing mill, the slabs to be used by the company in the manufacture of car wheels, which in turn will be used by the Standard Steel Car Company, the parent interest. The McClintic-Marshall Construction Company, Pittsburgh, erected the steel buildings, and a 55 x 60 in. reversing engine has been installed in the plant by Mackintosh, Hemphill & Co., Pittsburgh. Niven McConnell, for some years superintendent of the open hearth plant of the Sharon Steel Company, Sharon, Pa., now owned and operated by the Carnegie Steel Company, is superintendent of this new open hearth plant.

The Westinghouse Machine Company, East Pittsburgh, Pa., has begun the construction of the first pair of marine turbine engines ever built in this country for the use of the American Navy. Work has also been started on the first two Melville-Macalpine reduction gears, which promise to revolutionize steam turbine service on vessels.

New Lake Superior Mines

Some Mines Closing, but General Activity Continues

MARQUETTE, MICH., August 27, 1910.—Within the past year the United States Steel Corporation has opened five new mines in the Hibbing district of the Mesaba range. Two of these, the Mace, an underground property, and the Uno, an open pit, have recently entered the shipping list. The others are the Harold and the Mississippi, both of which are wrought from beneath the surface, and the Dale, whose deposit will be extracted by the steam shovel method. An exceptional record was made in developing the Mace. Clearing the ground preparatory to shaft sinking was not started until last Christmas, yet already the propty is sending out ore. The mine adjoins Corrigan, McKinney & Co.'s big Stevenson pit on the west. It is equipped with a fine plant of machinery and a steel shaft house. The ore is of high grade, and the deposit is extensive. Only 70 men are employed, but this force will be increased as fast as it can be done advantageously, the underground openings at present being somewhat limited.

What appears to be an important strike of ore has been made in the Biwabik district of the Mesaba by an exploring syndicate of which Joseph Sellwood of Duluth is the head. One drill hole has penetrated the deposit to a depth of upward of 100 ft. The tract being tested consists of 40 acres in the western outskirts of Biwabik and between the Canton and Holland properties. It had been in the hands of various interests for a number of years, yet notwithstanding its favorable location it has not been given systematic exploration until recently. Indeed, more drilling is in progress in the Biwabik district at present than at any time in the past. Exploration is being conducted throughout the territory from Aurora to McKinley. The Steel Corporation particularly is active in this respect.

Only One Mine Active in Nashwauk District

The Pearson and LaRue mines, in the Nashwauk district of the Mesaba, have suspended operations and it is expected that they will be out of commission the remainder of the season. The slow demand for ore is ascribed as the reason. The LaRue is a property under control of M. A. Hanna & Co. The Pearson is a property of Joseph Sellwood. It is an underground proposition, opened two years ago. There is considerable ore in stock and this is being shipped. On the Cleveland-Cliffs Iron Company's Crosby mine, at Nashwauk, production is being pushed. The Hawkins property of the International Harvester Company, the only other shipper at Nashwauk, also is being operated briskly.

A prospective early shipper on the Mesaba is the Elizabeth property, located on the east side of Longyear Lake and within the village limits of Chisholm. The mine has recently been sold by the John Helmer Exploration Company to interests represented by E. Drew and N. O. Pearce of Chisholm. The shaft has been extended to the ore body at a depth of 135 ft. and lateral development is under way. Tracks to the Elizabeth are being extended by the Great Northern Railroad. The Helmer Company at present is operating at Buhl under a contract with the Iron Mountain Mining Company, composed of business men of that village and other Mesaba range towns. Fifteen hundred ft. of diamond drilling will be done in a tract held under option and which lies within the village limits. The land adjoins the Culver property, the exploration of which has been very satisfactory.

Ten iron mining companies, the articles of incorporation of which have now been filed with the Register of Deeds of St. Louis County, Minn., have recently been organized at the head of Lake Superior. The titles of the new concerns are the Cambridge, Lebanon, Cumberland, Clarion, Crawford, Lancaster, Ligonier, Warren, Luzerne and Westmoreland. Each company is capitalized at $50,000, each has a life of 30 years and each may incur an indebtedness limited to $500,000. The directorate is the same in all, it consisting of A. T. Banning, C. H. Deighton, John Ames, A. E. Manthey and E. W. Stewart, all of Duluth.

Viaducts Over Ore Pits

An interesting work now practically completed is the construction of a steel viaduct spanning the Burt pit of the United States Steel Corporation in the Hibbing district of the Mesaba. The bridge is 350 ft. long and 80 ft. high. It gives a new outlet from the village, or at least it replaces one that must be abandoned on account of mining operations. The viaduct is the only structure of its kind on the Mesaba range, although at Corrigan, McKinney & Co.'s Stevenson mine the pit is spanned by a suspension bridge erected for the accommodation of the employees, the shafts and the shops being located on one side of the long and deep mining excavation, and the town and the offices of the company on the other. There is a clear span of 525 ft. at the Stevenson pit, and the total length of the cables upon which the bridge is suspended is 815 ft. These cables are hung on either bank from towers which are 50 ft. high, and securely anchored in concrete abutments planted deep in the earth.

The Stevenson pit is one of the very largest on the range, and that means in the world, for nowhere else except at Panama can excavations more stupendous in extent be found than in the Mesaba country. The steam shovels at the Stevenson have created a cavity a mile in length, more than 800 ft. in width and 140 ft. in depth. The erection of the suspension bridge a year ago has been the means of saving the employees the long walks formerly necessary. A viaduct similar to that at the Burt pit, but much larger, is in progress of construction over the tracks of the Steel Corporation's Duluth, Missabe & Northern Railroad at Proctor, 7 miles from the ore docks, and where are located the classification yards of the company. The span here will be 300 ft. in length on each side of the tracks. With the approaches the bridging will aggregate 1500 ft. The viaduct is being provided to do away with blockading the highway, such as is now frequently the case, as the ore trains are weighed. The work is being done by the American Bridge Company, builder also of the structure at the Burt pit.

The Hartford Mine

The United States Steel Corporation's lease on the Hartford mine having expired, mining operations at that Marquette range property have been suspended. The mine will not remain idle long, however. It has been leased for 10 years by the Republic Iron & Steel Company and will be restored to the active list shortly. The Hartford is one of the best mines in the Marquette district. It is owned in fee by the Teal Lake Iron Company, of which Gordon Fellows of New York City is the principal stockholder. It was leased to the Steel Corporation 10 years ago. Since that time it has produced 1,700,000 tons of ore, the great bulk of this being mined the past five or six years. The largest output was in 1906, when 365,000 tons was shipped. There are two shafts, the deeper of which is down 975 ft.

Prior to the time that the Steel Corporation took over the Hartford the property had been explored by the fee owners only in a quiet sort of way. The new operator placed a diamond drill in commission and put down several deep holes, tapping ground that had not then been tested. The Steel Corporation was successful in locating a very fine deposit of Bessemer ore and at once pushed a shaft into it. The property was given an excellent and substantial equipment, including a steel shafthouse. This equipment, it is understood, will

be purchased by the Republic Company. The Hartford adjoins the Republic Company's Cambria mine at Negaunee, and for that reason it can be operated to better advantage by the new leaseholder than any other concern. The properties will be connected by drifts. The Republic Company has been in need of an additional shaft at Negaunee, and one would probably have been started this year if the Hartford had not been taken over. The Steel Corporation still has considerable ore in stock at the property. A steam shovel is now loading this and will be busy with the work for a number of weeks.

New Publications

The Chemists' Pocket Manual. By Richard K. Meade. Size, 6¼ x 4 in.; pages, 444; illustrations, 39. Bound in leather. Price, $3. Published by the Chemical Publishing Company, Easton, Pa.

This is the second edition of a practical handbook containing tables, formulas, calculations, information, physical and analytical methods for the use of chemists, chemical engineers, assayers, metallurgists, manufacturers and students. In revising the book the subject matter has been entirely rearranged and many sections rewritten. Many new tables have been added and the section on analytical methods has been augmented by the addition of considerable new material, so that the book is double its former size. The compiler has endeavored to present information that would be of service to the plant chemist and chemical engineer in as condensed form as possible. The entrance of the chemist into the field of chemical plant engineering has made the inclusion of data and tables bearing on chemical engineering necessary in this book.

The volume is divided into two sections, one of which is general and deals with weights and measures, conversion tables, specific gravity of acids and alkalies, physical properties of gases, calibration of apparatus, volumetric solutions and analysis, qualitative analysis and assaying. The other is concerned with select methods for the technical analysis of substances such as iron, copper and lead ores, blast furnace slag, bearing metals, coal, gases of all kinds, water for both drinking and boiler feed, Portland cement, lubricating oils and soap. The methods given in this section are those which the author has tried in his own experience as a consulting and analytical chemist and chemical engineer, or have been secured from other practical chemists, and in a number of cases the text is supplemented by illustrations showing how the apparatus should be set up.

Taschenbuch fur Eisenhuttenleute (Pocket Book for the Iron and Steel Metallurgist). Size, about 5 x 7 in.; 946 pages; 610 illustrations. Written by a special committee of the Akademischer Verein Hütte, numbering 47, all men prominent in their special departments and some of them of international reputation. Published by Wilhelm Ernst & Sohn, Berlin. Price in cloth, 15 marks; in leather, 16 marks.

This book consists of five sections and an appendix. The first section, 285 pages, is subdivided under the following headings: Physical laws and tables, temperature measurements, laws of freezing and cooling, metallography, metallurgical-chemistry of iron, chemistry, ceramic pyro-chemistry, mineralogy, testing of material and methods of application. These subjects are treated in considerable detail and form a splendid groundwork for the rest of the book.

Section two, 85 pages, is devoted to fuel. The subdivisions are kinds of fuel, laws of combustion, materials for furnace construction, gas producers and coke manufacture. The last subject is very well treated, the writer of this part being Prof. O. Simmersbach.

The third section, 103 pages, takes up machines and by-products, under the following subdivisions: Power production, which is again subdivided into boilers, piston engines, turbine engines and large gas engines, and electrical machinery; auxiliary machinery, such as blowing engines and cranes.

The fourth section, 188 pages, is one of the most important, being devoted to iron and steel production and foundry practice. First come 50 pages on the different phases of pig iron production. The succeeding subdivisions are on wrought iron, the basic Bessemer process, the open hearth process, crucible steel, electric furnace steel and foundry practice. Fifty-seven pages are devoted to the last named, under the headings iron foundry, malleable iron, the Goldschmidt process, steel foundry, the small Bessemer, and the use of compressed air. The information on each subject is up to date and is presented in a very concise, practical way.

Section five, 216 pages, appears to be the most valuable and is on the working up of material. It treats of rolling mills and rolling mill practice in an exhaustive way. The subdivisions will not be given in detail as they are very numerous. Here, again, the information is given in an admirably concise manner and is very valuable. The two final subdivisions are on wire drawing and hammer and press work.

The appendix consists of 35 pages of statistics and tables. Many tables are also given in section one. The value of the book would have been considerably enhanced if many more references had been included. Even a busy steel works manager or foundry foreman often wishes to obtain more information on a subject than can be found here. As a whole, it is well worthy of its distinguished editorial board and of a place on the shelf of all interested in iron and steel production.

G. B. W.

A Canadian Open Hearth Record

The 5-ton basic open hearth furnace of the steel foundry department, Londonderry Iron & Mining Company, Ltd., Londonderry, N. S., is doing excellent work and proving, so far as known, a world's record breaker. The regular metallic charge is 12,000 lb., of which 40 to 50 per cent. is local sand pig iron carrying 1.25 to 1.40 per cent. phosphorus and occasionally as high as 0.2 per cent. sulphur. About 20 per cent. of limestone is used. Heats have been made—from beginning to charge to tapping—in well under four hours and an excellent quality of castings, both chemically and physically, produced. When considered that the furnace is charged by hand, and the charging alone takes about two hours, the work accomplished is all the more remarkable.

Owing to the intermittent character of operation common to steel foundry practice, only two heats per day of 24 hours are at present taken off, but everything points to a possibility, by continuous operation, of 30 to 40 heats per week of six days.

The furnace is built for producer gas, with slag chambers underneath the gas and air uptakes, and the regenerator chambers are under the charging floor. Present fuel, however, is oil. This is the only 5-ton basic open hearth furnace in Canada, and was designed and built by William Brown, the company's general superintendent, who also designed and built, assisted by Frank Smallwood, construction engineer, the entire steel foundry plant. Mr. Brown was for some years open hearth superintendent for the Dominion Iron & Steel Company, Ltd., Sydney, N. S., and prior to that held a similar position with several of the leading United States manufacturers.

The rod mill at the South Sharon, Pa., works of the American Steel & Wire Company, has resumed operations after being closed down for about six weeks for repairs and inventory.

Testing the Hardness of Metals

A Schedule of Standards Used by Automobile Engineers

In a paper on "Testing the Hardness of Metals" presented at the midsummer convention of the Society of Automobile Engineers at Detroit, Mich., July 28-30, A. F. Shore, inventor of the scleroscope, covered in part the ground traversed by his paper at the last Atlantic City meeting of the American Society for Testing Materials. A synopsis of the latter was given in *The Iron Age* of July 7, 1910, page 40. The Detroit paper presents also data developed in connection with automobile testing, from which the following extracts are made:

Only One Kind of Hardness Important

An almost complete set of hardness standards for various parts of motor cars has already been promulgated. These standards were gained by the practical method of trying out parts of various kinds of steel of predetermined hardness, under long and severe service. Some eminent American and European engineers have failed to understand certain conditions in metals, on which the scleroscope and the ball test agreed, but on which the sclerometer (the diamond scratching machine) and Foppl's test of forcing two metals together, as well as the Keep drill test, disagreed. Perhaps one of the things which has always been confusing is the claim that there are a number of different kinds of hardness, as tensile hardness, cutting hardness, abrasive hardness, elastic hardness, static hardness and shock hardness. Tensile hardness is supposed to be due to an increase of strength in a metal after cold rolling, without increasing the hardness as measured by the several scratch and drilling methods. Cutting hardness is based on the fact that if brass shows the same hardness as copper, in some instances the brass will cut the copper, but the copper will not cut the brass. Abrasive hardness is usually seen in materials which, according to the scleroscope and ball tests, show a low physical hardness, but which cannot be cut by tools of superior hardness; while the sclerometer or drill test gives high hardness readings. Elastic hardness is supposed to be what the scleroscope measures. The shock hardness is also what this instrument is alleged to measure, while static hardness is what the ball test measures.

According to my researches, there is but one kind of hardness which is really important. This may be defined as rigidity and resistance to penetration or deformation. It really does not matter whether a specimen can be filed or not, as long as hardness consistent with strength can be obtained. There is a close relation between the measured hardness and the elastic limit. Possibly this may be called tensile hardness, but it is not necessary to so call it.

Auchy has suggested the term "brittle hardness." Perhaps there is room for such a term as applying to carbon tool steels or any other steel not capable of taking a permanent set before fracture. It seems the term would be useful in differentiating between materials that are tough hard and those that are brittle hard, assuming that the hardness in each instance is the same. Tough hardness, if we may use this term, is one that can usually be obtained with steels alloyed with nickel, chromium or vanadium, and with pure low carbon steels having just enough carbon to harden up to a certain point high enough to include them in the category of automobile steels of the higher tempers.

Defective Treatment

Take an alloy steel, which has considerable tough hardness when properly heat treated. When overheated or soaked in the fire too long there will be a drop in its hardness as compared with the highest hardness obtainable, as shown by the scleroscope; yet it may not be fileable in the least.

If parts made of plain carbon steel case hardened, it is understood that the hardness should be up to about 100. When parts go to the inspector to be tested it may develop that there are two pieces which show, say, 90 hard, indicating that there has been chemical deterioration or improper quenching and simultaneous temper drawing due, perhaps, to the use of overheated oil.

Cutting tests are influenced by the abrasive element, attrition resistance, in a metal, which is strictly of a chemical origin. Whenever the file is used it will show something of the sorbitic, or martensitic condition; yet the file may absolutely ignore the true physical hardness. Without the file it would be a question in the mind of the inspector as to how the drop in hardness from 100 to 90 was brought about. If he takes the file and makes it bite a sorbitic tendency is indicated, and it is certain that the quenching has been improper and a certain amount of temper drawn. It may be that the parts will harden up to the standard when quenched properly. If the part is file hard a martensic tendency is shown, and it is certain that deterioration has occurred in the fire, which may be from one of two causes: chemical deterioration, due to excess of sulphur in the cement, or overheating for some length of time.

Case hardened parts when overheated and crystallized, although file hard, often show a hardness under the scleroscope as low as 60. Obviously such parts would fail in service. These drops in hardness due to deterioration by overheating or overexposure to the heat will be found to exist in almost any kind of steel, whether tool steel or alloy construction steel. The scleroscope is used as a means for calibrating the pyrometer in general.

Hardness Standards

The following is a list of hardness standards now in use by automobile engineers, having been obtained by several of the leading manufacturers, who worked independently and came to conclusions agreeing within 5 per cent.:

Frames, chrome nickel steel, 40 to 45 hard (represents an elastic limit of 75,000 to 90,000 lb. per square inch); plain carbon steel, 34 to 40 hard (represents an elastic limit of 40,000 to 50,000 lb. per square inch).

Axles, chrome nickel steel (0.35 carbon), 40 to 50 hard.

Crank shafts, chrome steel (0.35 carbon), heat treated, 45 to 55 hard. When the hardness is as low as 40, as careful experiments prove, the elastic limit is not only too low, but the rate of wear is very fast. A hardness of 65 is safe, being only a medium spring temper; but it is usually difficult to get this, and it is not absolutely necessary. When made of carbon steel the resistance of crank shafts to wear will be in proportion to the hardness. However, when the hardness is only 40 and the manganese and silicon contents are high, the resistance to wear is improved without increasing the hardness, although the elastic limit is always in proportion to the measured hardness.

Transmission shafts (square), chrome nickel or vanadium steel, 55 hard. When of plain steel the same hardness, but the shafts should be of larger dimensions.

Transmission gears.—The hardness specified for these parts runs from 60 to as high as 90, depending on the character of the steel used, as well as on the stresses imposed. The standard strictly adhered to by manufacturers of guaranteed gears is 80 to 85, when chrome nickel steel of good quality is used. When the hardness is up to 88 there is little danger due to brittleness. But when it is up to 90, breakage on corners occurs. Therefore, in sliding gears 85 seems to be the proper hardness.

Starting crank jaw, 60 hard.

Pump shaft, 70 to 80 hard.

Piston pins, cold drawn steel tubing (case hardened), 95 to 100 hard.

Steering arms, 90 hard on the friction surfaces.

Ball joint bearing surfaces, 55 to 75 hard.

Valve lifter roller pin, 60 to 65 hard.

Clutch shaft master gear, 70 to 80 hard.

Exhaust cams, 80 to 85 hard.

Valve lifter roller, 85 to 100 hard.

Inlet cams, 85 hard.

Fan cones, 70 to 75 hard.
Ball races, 85 hard.
Valve heads, 50 to 60 hard.
Cam shafts, 80 to 90 hard.
Steering worms, 70 to 80 hard.
Thrust and ball bearing rings, 80 to 95 hard. The lower hardness is confined to tough alloy steels, showing a high attrition resistance; the higher applies to plain steel after drawing temper.
Engine valve plungers, 90 to 100 hard.
Cones, 70 to 80 hard.
Keys, &c., 75 to 80 hard. This is a temper somewhat higher than that of piano wire, and is regarded as a high spring temper, making shearing practically impossible.
Nuts (special hardened), 90 to 100 hard.
Screws and bolts, all 40 to 50 hard. These ordinarily run from 20 to 35. When screws and bolts are subject to shearing the resistance offered will increase 95 per cent. for each increase in hardness of 100 per cent. Bolts are frequently subjected to undue strain through the use of large wrenches, but when they are hardened they offer considerably more resistance, and they retain their rigidity to a nearer approach to the elastic limit, which latter condition is also advanced by heat treatment.

Results With Springs

The writer has collected a lot of leaf springs made of different kinds of steel, such as are used by different motor car manufacturers, and which have failed in service, either by sagging or breaking. The idea was to ascertain, if possible, the most notable shortcomings; also to learn whether or not the hardware test would be of service. While considerable work is left to be done in this connection, it developed that in nearly every instance where failure occurred, either by breaking or sagging, a low hardness was indicated.

Springs made of chrome vanadium steel failed by sagging, at slightly under 60 hard, while the other leaves of the same spring, 60 and a little over, did not show evidence of failure, thus indicating by the scleroscope that 60 hard is the lowest safe limit for this steel. Thus far in the case of no springs that have failed in any way we found an overhardness. Good vanadium steel would be about 80 hard.

The writer has come to the conclusion that the proper hardness for ordinary carbon steel springs is from 60 to 75, and for special tough alloy steels from 60 to 80.

If the inspector were to select springs by hardness test, his decision would not be always correct, although he could eliminate most of the failures which now occur, as follows: All springs below 60 hard, while they may withstand the bend test usually given a leaf spring, will sag or break after some service.

Conclusion

The whole situation seems to point to three things as being necessary: Uniformity of raw material used, control of the heat treatment, and careful calibration of the pyrometer by aid of the hardness test.

The Mining Engineers' Visit to Panama

A recent issue of the *Canal Record* says: "The fall meeting of the American Institute of Mining Engineers will be held in the Canal Zone, and arrangements have been made to accommodate at the Hotel Tivoli the 125 members who are expected to attend. The delegation will arrive at Colon on the Hamburg-American steamer Prinz August Wilhelm on Tuesday, November 1, and leave for New York on November 8. On the day of their arrival it is proposed to show them the lock and dam work at Gatun, and then take them to their headquarters at Hotel Tivoli. On November 2 they will be taken through Culebra Cut. November 3 is the anniversary of the independence of Panama and, as no work will be done on the canal on that day, the visitors will have an opportunity to attend the carnival in the city of Panama. On November 4 the works at Pedro Miguel and Miraflores will be visited, and on November 7 the relocation of the Panama Railroad."

Charcoal Iron Car Wheels

The complaint that "cast iron wheels are not as good as they used to be" is taken up by the *Railway Age Gazette*, which goes back to the days of cold blast charcoal furnaces, with 10 to 15 tons a day output, and cites the irons of this description that were used in making chilled car wheels. The pig iron in one case cited (Greenwood in central Pennsylvania) had a tensile strength of about 22,000 lb., which was brought up to 33,000 lb. by remelting in the air furnace. It had 2.83 per cent. combined carbon out of a total of 4.14 per cent., and silicon was 0.43 per cent. The wheels were cast against an iron chill quite in accord with present practice, and were piled, while still hot, in the Whitney annealing pits, which had been previously heated to the temperature of the wheels, where they were allowed to cool. In the following discussion of the service rendered by the charcoal wheels of the old days our contemporary points out that the chilled charcoal iron wheels of to-day do not represent deterioration metallurgically:

Old Time and Present Day Wheels Compared

As to the service which these wheels rendered there are no records. None were kept because there was no realization of the necessity for or desirability of such records and because it was generally expected that, under the light total loads of about 40,000 lb. on eight wheels, they would outlast the car. It would be a safe guess, then, to assume their life at from 12 to 20 years. It is needless to say that such a life is unknown under present day conditions. The point is what would the same wheel do now? Pure cold blast charcoal iron is but a memory because it gave way long ago to the warm blast product, which is to-day its most related survivor. There are still a few wheels made of a warm blast charcoal iron, where the blast runs from 450 to 500 degrees F., and the furnace output still ranges from 15 to 25 tons a day. The condition has not changed for 30 years. Made from a brown hematite ore, melted in a charcoal furnace, with a fuel consumption of 1 to 2 of ore, the pig probably varies but little from that used in making the good old wheels of the past. The ore runs about 50 per cent. of iron, and the product possesses the high chilling qualities needed for car wheel metal.

Based on past practice which was so satisfactory for the wheels of light cars, the mixture still consists of 40 per cent. of this warm blast pig with a balance of car wheel scrap. The only change lies in the weight of the wheel, which has increased from 450 to 700 lb. But these wheels are put under cars weighing 40,000 lb. with a capacity of 100,000 lb., instead of those weighing 18,000 lb. and carrying a load of 20,000 lb. Speeds are not only higher but the average daily milerge is probably greater; so that the stresses imposed are undoubtedly much more severe than the mere difference of loads would indicate.

From the reports of a road using these wheels, it is learned that where the removals are for purely wheel defects, such as worn through the tread, shelling out, seamy treads and the like, the life ranges from 10 to 38 months, with an average of between 29 and 30 months for all wheels removed. If this life is considered on the basis of the probable ton mileage carried, and this is put at the low figure of four times that of the wheels under the light 10-ton cars, we find that the actual work done will correspond to about 10 years of service under the old conditions. This undoubtedly falls short of what was actually done under the light cars, but is enough to indicate that the charcoal iron wheel is probably quite as good metallurgically to-day as it ever was.

The point is, is it good enough or can it be improved? Undoubtedly brake action and the heat resulting therefrom are responsible for much of the excessive stress put upon a wheel, and the inference to be drawn from a pamphlet issued by the Association of Manufacturers of Chilled Car Wheels is that an increase in the thickness of the plate will go far toward relieving the strains so set up and in dissipating the heat. But of the wheels removed, to which allusion has been made, it is not brake action but legitimate wear that is responsible for the major portion, so that, basing the statement upon the assertion of the manufacturer that no change has been made in methods, from the mining of the ore to the delivery of the wheel, in 30 years, it is not in a reversion to the good wheels of the past that we must look for the betterment of the cast iron wheel of to-day, but to an improvement of the present methods of manufacture and possibly in the quality of the metals used in the mixtures though it may be said that these wheels do seem to be giving better results than others that are made under the more modern conditions of a greater tonnage all along the line from the furnace to the annealing pit.

Iron and Steel Analysis

A Modification of the Oxidation Method for Determining Sulphur

BY WARREN I. KEELER*

Much has been recorded as to the relative merits of the oxidation or gravimetric method and the evolution or volumetric method for sulphur. Particularly in foundry and steel works laboratories has the evolution method found favor, due to the rapidity with which a great number of determinations may be carried out at once; but for a commercial testing laboratory, where the sulphur content of samples received may vary in one day from 0.010 or under in a high grade of pig iron to 0.200 and over in white iron, this method has serious drawbacks.

On the other hand, few works or commercial laboratories can afford to run sulphurs by the standard method of solution in and oxidation by concentrated acids, when it is necessary to take the better part of a day with constant care and attention to dissolve and evaporate a few samples only, and then wait some hours before filtering, after precipitating the barium sulphate with barium chloride.

Very little can really be said in favor of the evolution method except for its speed, and the writer proposes to describe in detail a modification of the oxidation method, which will no longer leave any one the excuse of saving time for using the former.

The method to be described has been used for some months in the author's own laboratory with perfect success, and he has seen it used previously for two years, day in and day out, on all kinds of pig irons, products, steels, alloys and miscellaneous work with constantly increasing dependability. As to accuracy the method has been repeatedly checked by various analysts on a large variety of reliable standards, Government and otherwise. While, so far as is known, this modification has never been published, the method was not worked out by the author, and he claims no originality therefor. It has been found necessary to follow the procedure quite closely, hence it is given below in considerable detail.

The Method for Irons

For irons, a two-factor weight of 2.750 grams in the case of sulphur content up to 0.100, and single factor if higher, is carefully weighed and brushed into a 300-c. cm. Erlenmeyer flask of Jena glassware. Thirty cubic centimeters of concentrated nitric acid is added, and the flask is placed on the cooler part of a hot plate until solution is practically completed, as shown by the cessation of all action; now 5 c. cm. of concentrated hydrochloric acid is added, and the flask pushed into the center of the plate where it quickly goes to dryness. Although in some cases there will be a little spattering just before dryness is reached, the nature of the container precludes all loss thereby.

The baking is continued until the oxides will break loose from the bottom of the flask, or if, as sometimes happens, these oxides will not break loose, then continue baking for five minues after all fumes of nitrous oxide have disappeared. Take off the plate, cool, add 20 c. cm. of concentrated hydrochloric acid, and evaporate down again to a heavy syrup.

There will now be under 5 c. cm. of total liquid; the proper concentration can be told with a little experience by the crackling sound produced on shaking the flask for a second or two.

Next, 2 or 3 c. cm. of concentrated hydrochloric acid is added again, the contents of the flask are just brought to a boil and removed from the plate. Hot water is added in sufficient amount to about fill a 2-in. funnel twice on filtering; and the contents of the flask are thrown on a filter paper carefully fitted in the funnel. The flask is rinsed out three times with cold water and the paper washed alternately with hot dilute hydrochloric acid (10 per cent.) and cold water until the washings come through perfectly clear and colorless.

The filtrate is best caught in a tall plain beaker of 150-c. cm capacity, and the volume should be kept down to two-thirds the capacity of this beaker. Now add 15 c. cm. of barium chloride 20 per cent. strong, and slowly bring to a boil, allowing to boil quite hard for 15 to 20 minutes; then push back to a cooler portion of the plate and allow to settle for one-half hour. Filter through double filter papers of dense quality. Wash the precipitate carefully on the paper with hot, dilute acid; allow to run through, and refilter; next wash alternately with cold water and hot dilute acid until the paper and washings are absolutely colorless. An experienced operator may accomplish this in four washes, two of each kind. Ignite the barium sulphate as usual, taking care not to hurry at first.

For Steel

In the case of steel, the procedure differs only in method of solution. If the steel is mild or low in carbon content, no trouble will be experienced, but if the carbon is high, or alloy steels are met with, solution may be hastened by adding a little concentrated hydrochloric acid in the first place; and occasionally it is necessary to add a few cubic centimeters of the hydrochloric several times. Furthermore, the steels are much more likely to bump and spatter, so that evaporation must take place much more slowly; or else a pair of tongs may be used for shaking over a free flame and the evaporation hastened by blowing through a so-called blower—a bent glass tube of large bore with a rubber connection for the mouth.

Ferroalloys

In the case of ferroalloys, especially ferrosilicon, recourse may be had to a small amount of C. P. hydrofluoric acid, but this must be added very slowly and cautiously, and the solution must be baked twice and well, or else the sulphur will be high; due probably to the formation of an insoluble double fluoride. The use of hydrofluoric acid is not to be recommended, but sometimes solution is otherwise impossible, and if the precautions stated are carefully observed no error will result therefrom.

As mentioned before, this method is capable of a very high degree of precision, but it will be found necessary to adhere to the above directions very closely. There are a number of simple but radical changes over the old procedures which all combine to reduce the time factor to a minimum. It may be well to emphasize these points.

The Changes in Procedure

In the first place, the simplest and yet most radical change of all over former details is the use of the 300-c. cm. Erlenmeyer flask for solution and evaporation. It is, however, quite necessary to use Jena glassware or its equivalent for this purpose, as the strain is severe. To any one who has carried through the tedious and cumbersome evaporations in casseroles or beakers on a sand bath the use of the Erlenmeyer in this instance will come as a revelation.

Another distinct change comes in the use of the barium chloride solution of 20 per cent. strength. It has always been recommended to use a 10 per cent. solution, but the stronger solution seems to give a more granular and rapidly settling precipitate.

It may be well to speak of the washing of the barium chloride. Too much care cannot be exercised at this point; if thorough washing is not accomplished the results will surely be high, as noted by numerous writers from various causes; on the other hand, care

* Laboratory of Davenport & Keeler, New Britain, Conn.

must be used not to stir up the precipitate too much, else the barium chloride tends to pass through the filter and give consequent low results. If at any time the method gives suspicious results, the chances are all in favor of carelessness at this stage of the process.

This method has been tried out on a great variety of materials, and it is safe to say that it can be used on anything that is dissolved or decomposed by the strong acids. It has even been used successfully, with slight modifications, on such things as paper, cloth and rubber.

A short table of results on standards and miscellaneous material taken at random from the author's notebook will give one proof positive of the accuracy:

Table of Results.

Blank	0.001
Carbon iron	0.005
Carbon iron	0.006
Dora iron	0.023
Dora iron	0.023
Open hearth steel	0.057
Open hearth steel	0.059
Bessemer steel, 0.060 standard	0.060
Bessemer steel, 0.060 standard	0.061
Cast iron, 0.034 Government standard	0.034
Cast iron, 0.034 Government standard	0.033
Crucible steel, 0.020 standard	0.019
Crucible steel, 0.020 standard	0.020
Chrome tungsten steel	0.012
Chrome tungsten molybdenum steel	0.008
Chrome tungsten molybdenum steel	0.008
White iron, 0.250 standard	0.250
White iron, 0.250 standard	0.247
White iron, 0.250 standard	0.246
Ferrosilicon	0.022
Ferrochrome	0.007

In conclusion, it may be emphasized that the method has three general characteristics which insure its popularity: It is available in foundry and steel laboratories for all classes of work, low and high grades alike; it is absolutely accurate; and it is rapid, in fact, very rapid, for the degree of accuracy given.

Two or three determinations, if given the sole attention of an experienced operator, may be concluded in one hour. A batch of 24, started at 8.30 a. m., may be finished by a careful and rapid manipulator at 1 o'clock in the afternoon. He will also have time to attend to the corresponding 24 determinations of phosphorus in the same period.

Coal Car Distribution Among Mines

Distribution of coal cars by railroads among the mines along their lines must be made, according to an opinion handed down August 18 by the Interstate Commerce Commission, in accordance with "an equal or a justly ratable use of the facilities of an interstate carrier," and with "the assurance also that no other shipper shall fare ratably better at the hands of the carrier."

The opinion was rendered in the case of the Hillside Coal & Coke Company against the Pennsylvania Railroad Company. It is held that the defendant's rule "providing that the capacity in tons of such 'assigned' cars shall be deducted from the rated capacity of the mine in the distribution of all 'unassigned' cars is unlawful and discriminatory." It is announced, therefore, that the rule unduly discriminates against the complainant and other coal operators similarly situated and is in violation of law.

The commission reaffirms its previous ruling to the effect that "the owner of private cars is entitled to their exclusive use and that foreign railroad fuel cars assigned to a particular mine cannot be delivered to another mine," but it again holds that "all such cars must be counted against the distributive share of the mine receiving them."

In this particular case the complainant claimed damages of about $127,000 because cars for the shipment of coal were not delivered to it. This phase of the matter, however, it reserved by the commission for further argument.

The Hayes Run Fire Brick Plant

The Hayes Run Fire Brick Company, Orviston, Centre County, Pa., manufacturer of high-grade fire brick, suffered the loss by fire of the principal part of its plant July 29, 1909. Deciding at once to rebuild, and to erect a better plant than the one destroyed, the directors instructed General Manager Carroll W. Keller to visit a number of the best equipped fire brick works in the country for the purpose of incoropating the most approved features in the new construction. Buildings of brick and steel were decided upon, and the result is a practically fireproof set of buildings, all well lighted and ventilated and equipped with the most modern appliances. The production of brick was resumed just six months after the fire.

The main building, which covers the drying floor, is 85 x 304 ft.; the crusher and bin building, which adjoins the main building, is 50 x 80 ft. and 40 ft. high; the engine and boiler building is 50 x 50 ft. The dry press and ground clay department is located in a separate building, 25 x 75 ft., three stories high, equipped with elevators and conveyors. In this building are a Clearfield dry pan, a Dunlap perfect clay screen and a large Boyd dry press. The machinery in the hand-made department consists of a large Champion crusher, with elevator and conveyor, and two Clearfield wet pans. The power for running the plant is generated by two Keeler boilers and a Nordberg Corliss engine. The electric light plant, which is located in the engine room, is of capacity sufficient to light the whole plant as well as the streets and many of the buildings in the town.

There are 20 kilns for burning brick, with a capacity of 40,000 bricks each. The capacity of the hand-made department is 35,000 to 40,000 bricks per day and of the machine-made department from 15,000 to 20,000 bricks per day. The clay and coal used are taken from the company's own mines, about 4½ miles distant, and conveyed to the plant over its own railroad.

The company finds its trade constantly growing, not only in this country but in other countries as well. The export trade is on the increase, large shipments having recently been made to Cuba, the Philippine Island and New Zealand. E. L. Orvis is president of the company, J. R. Stevenson is vice-president and W. O. Bentley is secretary. The treasurer, I. L. Harvey, who is a son of the organizer of the company, now deceased, takes an active part in both the manufacturing and sales departments.

The plant for briquetting blast furnace flue dust at the Duquesne Works, Duquesne, Pa., of the Carnegie Steel Company is receiving much attention in the daily papers, which refer to the matter as the first attempt to utilize this waste product. This is not correct, as the briquetting of flue dust has been in progress at a number of other blast furnaces for a long time. The plant at Duquesne, however, is the first of its kind in this country. It is an application of the Gröndal process, which is controlled in the United States by the American Gröndal-Kjellin Company, 45 Wall Street, New York. A statement regarding this was made in *The Iron Age* of March 31, shortly after the contract for the installation of this plant was placed.

R. W. Raymond, manager of the industrial department of the Seattle Chamber of Commerce, Central Building, Seattle, Wash., states that opportunities can be found in that city for iron working plants of various kinds. He mentions, especially, a plant for the manufacture of steel castings.

S. DIRECTIONS
Mechanical and Civil Engineers,
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The Argentine Exposition

The United States Steel Products Company's Exhibit

The following description of the elaborate exhibit now being made at the International Exposition of Railways and Land Transport at Buenos Aires, Argentina, by the United States Steel Products Export Company, whose name has just been changed to United States Steel Products Company, is taken from the English daily paper of that city, the Buenos Aires *Herald*, of June 23:

Owing to the importance of the United States Steel Corporation in the industrial world, and the romance surrounding its operations, the exhibits of the products of its mills must be of great interest to all visitors to the North American section of the Railway and Land Transport Exhibition. It is largely due to the excellence and cheapness of its manufactures that modern methods of building have developed. The United States Steel Corporation consists of the following producing companies: Carnegie Steel Company, Illinois Steel Company, American Steel & Wire Company, American Sheet & Tinplate Company, American Bridge Company, Lorain Steel Company, National Tube Company, Shelby Steel Tube Company, Tennessee Coal, Iron & Railroad Company. In addition to these is the United States Steel Products Export Company, which has charge of the entire foreign trade of the United States Steel Corporation, and in that capacity is exhibiting in Buenos Aires.

A New Policy as to Exports

The purchasers of North American manufactures have heard so much about the intermittent dumping of these goods into other countries that they have come to believe that the only interest North American makers have in export business is the selling of their surplus to foreign countries at times when their own market is dull. This is no longer the attitude of the larger and more progressive companies, which now realize that satisfactory foreign business cannot be transacted on that basis. By the establishment of its export company the United States Steel Corporation scientifically blazed a trail which others are following in this country.

Regardless of home conditions is a certain proportion of the output of the mills at the call of the Export Company, whose policy it is to retain clients when they are obtained, and to cater for their requirements, regardless of the condition of the home market. In addition to this, the fact that this organization handles nothing but export materials enables it to give the attention to the requirements of customers that a company handling both export and home sales cannot do.

The importance of South American trade, due to the rapid development of the various countries, particularly Argentina, resulted in the establishment of an office in Buenos Aires. Later on offices were opened at Valparaiso and Lima. In connection with the Buenos Aires office there is an engineering department with competent engineers in charge.

It is chiefly due to the United States Steel Products Export Company that North American industries have a creditable representation at the exposition. The Export Company, realizing the value of the opportunity offered, undertook to interest other companies in the project, and its representations were so successful that the foremost industrial enterprises in the country decided to take space and show their products to the people of Argentina on the occasion of her centennial.

An Entire Building Used for the Exhibit

The display made by the United States Steel Products Export Company in the North American section is fully worthy of the great corporation both as regards size and quality. It occupies an entire building, 75 meters (346 ft.) long by 15 meters (49 ft.) wide, and embraces nearly every class of steel material, ranging from springs to a 60-ft. turntable for a 127-ton engine.

Realizing that the exhibits which are found most interesting are generally those where machinery or appliances are in operation or construction, the company has installed a blacksmith's forge with artisans engaged in making tests demonstrating the quality of materials. There is also a series of illuminated transparencies showing the various stages of manufacturing steel rails, beginning at the ore pile. In manufacturing steel products the corporation's mills have full control of every stage, from oré to the finished product. This not only gives them control of the manufacture, but could not be obtained where a portion of the operation depended on outside interests. This is of particular importance with respect to ores, which vary considerably. The mills always obtain their ores from the mines owned by the constituent companies.

The Shelby table, which will be exhibited by the Tube Department, deserves special mention, as it is constructed entirely of seamless tubing. The top is made of short pieces of Shelby seamless tubing set firmly endwise in a matrix of special composition. The top is polished to an even surface and covered by a sheet of plate glass. This design is perfectly symmetrical and balanced, and there are more than 3000 pieces of tubing used in making it.

The exhibit of the Bridge and Building Department will consist of a locomotive turntable, an office building and some miscellaneous material.

The turntable is a 60-ft. structure designed for turning a 127 gross tons engine. The rolled steel of this table is open hearth steel, ultimate strength 55,000 lb. to 65,000 lb. per square inch. The saddle casting is readily attached to the center girder of the turntable and rests on the cylindrical top surface of the upper roller box, thus securing freedom of motion longitudinally and a uniform distribution of the weight of the rollers. These locomotive turntables are made for any capacity of locomotives and from lengths varying from 40 to 85 ft.

An Office Building Shown

The office building is designed to show typical structural steel work. The limited space would not allow of an elaborate building. Sufficient will be shown, however, to give an idea of the steel structural building which plays so important a part at the present time in the cities of the United States. In New York, in particular, and in almost every city of any size, in a greater or lesser degree, steel construction is now employed for all office, hotel, warehouse and large buildings. This means a greater utilization of ground space on account of the hight to which these buildings can be erected, and, consequently, a rise in rental and land values.

This method of building was begun and has been carried to its greatest limits in New York, which, owing to the fact that it is mainly located on a narrow island, has only a limited area, and the "downtown" section

has become enormously valuable, one tract having recently sold for about $1 a square inch.

In order to use this land to the best advantage, the method of steel construction was brought into use. This makes it possible to erect buildings 20 to 30 stories in hight in the course of a few months. Some of these buildings stand on extremely small pieces of land and the steel structure is in reality a bridge turned on end. In New York few office buildings are put up in the "downtown" section, at the present time, of a hight less than 20 stories.

The great value of land in Buenos Aires and increasingly high rents make this form of construction the one that is bound to be largely adopted here, and the United States Steel Products Export Company, realizing this, has established a technical office in charge of engineers who have had wide experience in the United States in this class of construction, so that architects or proprietors of buildings may send their plans there and have an estimate and a complete design made for steel construction.

This style of construction has the double advantage that it is more economical than bricks or stone for large buildings, and that the building can be erected in less than one-half the time.

The first building of this kind put up in this city was the Plaza Hotel, an 11-story building, the steel for which was all manufactured and fabricated by the United States Steel Products Export Company, and shipped to the site ready for erection. The company has since secured orders for a number of other buildings of the steel skeleton type. It is at the present time erecting the 13-story building of the Oficina de Ajustes de Ferrocarriles, and has just completed the Grand Hall at the exhibition, which was erected and roofed in in less than 30 days.

The Carnegie Steel Exhibit

The visitors will naturally give attention to the exhibit of the Steel Department. The name Carnegie, which is the name of one of the constituent companies of the United States Steel Corporation, is rapidly becoming known in South America and other parts of the world by reason of the excellent quality of steel that it represents, and by the fact that Carnegie steel sold by the United States Steel Products Export Company is constantly offered in foreign markets regardless of the home demand at the mills where it is produced. Carnegie steel is manufactured by the Siemens-Martin basic open hearth and the acid Bessemer processes, in addition to which several special processes of manufacture are in use. The steel is manufactured according to specifications commonly used in the United States, but, when required, can be made to conform to most of the standard governmental and railroad specifications.

The Schoen solid forged and rolled steel wheel, which will be on exhibition, is the natural outcome of the demand of the railroads and tramways for a wheel of simpler form than a steel tired wheel, but of the same high quality of steel. This demand was met in 1903 by Charles T. Schoen, the pioneer builder of all steel cars, in the manufacture of the Schoen steel wheel. The wheel is made from a single piece of steel of the quality used for the manufacture of tires and through a process of forging and rolling an entire homogeneous wheel is produced. The process consists of forging the steel under two hydraulic presses of 7000 and 5000 tons pressure, and then rolling the web and rim in a set of specially prepared rollers, which bear with great force against each side of the web, at the same time pulling endwise against the inside of the rim. A second set of rollers engages the opposite face of the rim, while the fifth roller resists the longitudinal pressure of the web rollers and bears against the tread and flange.

Several hundred thousand Schoen wheels have been in service on American railroads for the past seven years, and it has been determined from the mileage records obtained that for goods wagons (freight cars) a mileage of from 15,000 to 20,000 miles can be secured per 1-16 in. wear. As the steel is of the same quality as tire steel, it can be re-turned in the lathe, just as a steel tire is.

The use of steel sheet piling for construction work has only come into general use of recent years, but it now displaces wood formerly used for coffer dams and for temporary subaqueous construction. The light weights are specially adaptable to sewer work and the heavier weights are suitable for driving through harder material.

Steel piling is driven in the same way as wood piling, with a drop hammer or ordinary pile driving steam hammer, and it has an advantage over wood in that it may be withdrawn and re-used. This is extremely important in this country where the price of wood is so high. For temporary construction purposes steel piling has had much use in coffer dams for bridge piers, buildings and light houses, and in deep water cribs for water works intakes. It is particularly adapted to the permanent construction of docks, sea walls, water bulkheads, casings, breakwaters, wharves, dykes, locks and all forms of construction where it is necessary to resist the percolation of water.

Street Rails and Steel Ties

Some of the Lorain open hearth steel tramway rails, frogs and switches will be seen. These are rolled for all the standard American sections, the 10 British standard sections and a large number of special designs for nearly every country in the world.

Lorain tramway rails are rolled from basic open hearth steel, carbon 0.60 to 0.75, phosphorus not over 0.04, silicon not to exceed 0.20, manganese 0.60 to 0.90. Lorain rails have a tensile strength of 110,000 lb. per square inch.

Lorain special frogs and crossings with manganese steel insets are used on most of the important tramway systems of the world, and have always given satisfaction. They are employed extensively in Buenos Aires, Montevideo, Bahia, Rio de Janeiro, Sao Paulo, Manaos, Para and elsewhere.

In the United States, owing to shortage of wood suitable for making railroad sleepers, a demand has sprung up in the past few years for steel sleepers, and here in Argentina, owing to the impossibility of securing sufficient "quebracho" sleepers, steel sleepers have already been introduced on a number of the leading English railroads.

Most of these have been of the trough type, but in the exhibit of the United States Steel Products Company the type will be shown which has found favor on the North American railroad lines, where conditions are similar to those in this country. They are made in the form of a joist with a wide base, making them extremely easy for tamping. There are several different weights, suitable either for the heaviest traffic of a railroad, or in lighter sections for tramway purposes. This latter form is particularly serviceable where concreting is necessary in paved streets.

The United States Steel Products Export Company will have a forge working in its exhibit for the purpose of demonstrating the remarkable qualities of Carnegie X, which is the name used for the highest grade of bar manufactured where a tough ductile bar is required, and where Lowmoor and other expensive irons have heretofore been exclusively used. Carnegie X shows the same or even more remarkable results, at a cost of about one-half of these high-grade irons.

One exhibit of this company which will not fail to interest "estancieros," is the exhibit of woven wire fencing, which is made in several different styles suitable for estancias or quintas. This fencing is strong enough to keep in cattle and arranged with a small mesh for the first 18 in., which will keep out hares.

The Steel Corporation's Products in South America

The products of the United States Steel Corporation are in use all over South America. In Argentina some of the bridges and buildings for which the American Bridge Company has supplied material shipped ready for erection on the site are as follows: Buildings for Argentine Quebracho Company; highway spans for Entre Ríos; steel sheet piling for Buenos Aires & Pacific Railroad, and Department of Ways and Bridges and Department of Irrigation of the Argentine Government; car house for La Capital Traction Company; 30-meter span for Province of Corrientes; Plaza Hotel, Buenos Aires; Railway Building (Clearing House), Buenos Aires; Santa Fé station of the Ferro-Carril Central Norte; two 136-meter and one 167-meter spans for F. C. Central de Buenos Aires; Grand Hall for Railway Exhibition; apartment house for Mr. Del Solar, Buenos Aires; bridges and building for Paraguayan Central Railroad; shot tower for Society Anónima Elaboración General de Plomo Rosario de Santa Fé.

Steel rails have been furnished to a great number of South American railroads, including the following:

Argentina.—F. C. del Norte, F. C. Central Northern, Patagonian Railways, Buenos Aires Great Southern, Argentine Great Western, Entre Ríos Railways.

Chili.—Trans Andino, Chilian Government (Longitudinal).

Bolivia.—National Railways of Bolivia.

Peru.—Peruvian Southern, Peruvian Central.

Ecuador.—Guayaquil & Quito.

Colombia.—F. C. del Canca, Colombian National, Amage Railway.

Brazil.—Central Railway of Brazil, San Luis a Caico Railway, Araraquera Railway, Cie. Auxiliare (Rio Grande do Sul).

Tramways for which it has supplied rails or special work are these: Anglo-Argentine Tramways, Arica-La Paz Railway (Chili), Baturite Railway, Bolivian National Railways, Buenos Aires Electric Tramway Company, Buenos Aires Grand National Tramways, Buenos Aires & Belgrano Tramways, Cia. Gen. de Trans. de Buenos Aires, Central Railway of Peru, Cerro de Pasco Railway Company, Chemins de fer de l'Equateur, Chimbote Railway Company, Anónima Tranvías Eléctricos de Caracas, Concepcion Electric Company, Entre Ríos Railway, Guayaquil & Quito Railway, Linha Circular (Bahía), Lacroze Tramways, Bahía Tramways, La Capital Traction & Electric Company, La Paz Tramways, La Sociedad Comercial de Montevideo, Lima City Tramways, La Electra Guadalajara, Manaos Tramways, Para Tramways, Roí de Janeiro Tramway Light & Power Company, Santa Marta Railway, Southern Railways of Peru, Tucuman Tramways, Transatlantic Tramways of Montevideo, Trilhos Central Bahía, United Electric Tramways of Montevedio, Union & Marowas Tramways.

Pemberton Smith is to be congratulated on representing such a corporation in Buenos Aires, and the corporation is to be heartily congratulated on having such an able representation.

Australian Industrial Conditions

SYDNEY, NEW SOUTH WALES, July 9, 1910.—The labor party, which has always wielded great political power in Australia, without having absolutely a free hand to work out the programme of its leaders, carried the day in the recent Federal elections. For the first time in its history the commonwealth, for good or ill, will be dominated in its legislative action by men whose activity in the way of hampering capital and defying the manual toiler has for years been more in evidence in this southern land than anywhere else in the world.

Notwithstanding the extreme views of the leaders of the party into whose hands political power has fallen, conservative business men do not seem to be at all apprehensive of radical action by the new government. There is a general willingness to accept the situation and to let the new legislators have an opportunity to work out their programme upon the lines which the labor leaders have long advocated, but which, until now, they have not been able to carry as far as they desired. "Let them have a fair chance; if they make a failure of it we'll turn them out," is a phrase heard, which may be taken as reflective of the attitude of the business community.

The state of New South Wales appears to be enjoying a fair share of prosperity, although the long strike of the coal miners at Newcastle caused great local depression, which has not yet been entirely dissipated.

A more vigorous attempt is being undertaken by the authorities in Australia to induce immigration and active efforts are being made to establish new industries. This is especially the case in western Australia. At a recent banquet the president of the Perth Chamber of Commerce said that £5,000,000 had been invested in manufactures in western Australia, but the investors had had a hard struggle, and had received but little assistance from the government. In order to build up the industries they desired the government to give preference of, say, 10 per cent. to all goods made in the state. They also thought the government should establish a museum showing what could be manufactured in western Australia. They would never rest content until every bit of agricultural machinery required by their farmers was manufactured or produced in the state.

An effort will shortly be made to manufacture heavy steel rails here, for the government railroads. A few days ago the Sydney *Morning Herald* had the following:

> A proposal that heavy steel rails shall be manufactured at Lithgow is now under consideration. It has always been hoped that the manufacture of steel rails, which form such a heavy proportion of the total manufacture of steel, would be undertaken in Australia, and at the time of the making of the contract between G. & C. Hoskins, Ltd., and the state government, the manufacture of the heavy steel rails used on the railroads was allowed for, whenever the time arrived when Australian works were competent to manage it. The project has now at last come up for serious consideration.

Commenting upon the subject further, the same journal cites facts from the history of steel manufacture in America.

The establishment of an adequate system of wireless telegraphy, a movement rather long delayed in a country with so extensive a coast line and such important maritime interests as Australia, is now being considered here.

Bounties aggregating £32,578 12s. were paid by the Commonwealth government during the financial year ending June 30. The beneficiaries were G. & C. Hoskins of the Lithgow Works. The total was made up as follows: Pig iron, £23,510 8s.; steel, £1491 5s. 6d.; puddled bars, £1254 3s. 4d.; galvanized sheets, £286 13s. 4d.; wire netting made from wire manufactured in the United Kingdom, £6036 3s. 10d. The quantities on which bounty had been paid were, roughly, as follows: Pig iron, 39,183 tons; steel, 2485 tons; puddled bars, 2090 tons; galvanized sheets, 203 tons; wire netting, 3460 tons. The total value of the galvanized sheets and wire netting on which bounty had been paid was as follows: Galvanized sheets, £2866; wire netting, £60,361.

G. & C. Hoskins intend to work the rich iron ore deposits which are known to exist at Tallewang, 12 miles from Gulgong. A lease of a large area of Crown and private lands has been secured, and it is intended to construct a light line of railroad from the existing line to the ore property. The ore will be sent to Lithgow for treatment. There is enough ore in sight, it is said, to give employment to 100 men for the next four years.

J. J. D.

Building Up an Export Business

BY WILLIAM J. A. BAILEY, NEW YORK.

Certain fundamental rules must be followed by those who wish to create a worth-while trade in foregn markets, and these will serve as a basis for the sale of any product in any country of the world. While quality and price must always be considered, still there are far more serious essentials that make for the permanent, growing satisfactory business which is the aim of all manufacturing industries conducted on a modern basis. In a previous article * I discussed the methods used by the majority of our manufacturers to secure trade in foreign markets, and I pointed out the defects of these methods. It is true that no system can be perfect, and that what might prove resultful with one class of goods may not answer for another, yet no matter what specific methods may be employed a certain substantial foundation must be constructed in every case. Some of our manufacturers to-day are doing a successful business throughout the world, and a careful examination into the methods they have employed will reveal the fact that they took up the subject in a most intelligent and broad-minded manner, and secured success by a constant application of that much spoken of, but little used, article—common sense.

The most essential element in foreign trade exploitation is the absolute necessity for the manufacturer to reach the buyer direct and use his own efforts to create a demand for his products. It is immaterial through what channels the orders may come, but the creating of the business must be the work of the manufacturer himself, and to assist in this a few suggestions are offered, outlining a careful sales system. In fact, these may well be called

Success Axioms for Export Trade

1. The most important proposition is to ascertain where your products will sell best. This is also, perhaps, the most difficult, as it involves a careful analysis of the requirements of the various countries and a thorough understanding of conditions in each place.

2. A thorough study of an atlas of the world is recommended, and a clear conception should be obtained of each country individually with regard to its area, population, climate, laws, language, currency, stage of material advancement, &c.

3. The business methods of the countries in which you plan to exploit your product should be carefully analyzed and conformed to. The world is large, and the people are of vastly different temperaments in the different parts, so that where local prejudices or idiosyncrasies of any kind are met with they should be respected and even favored.

4. Your products must be adapted to suit the individual requirements of each market. Sometimes the style of package, shape, size, color, or other feature must be altered to secure a trade for an article, and while the first few orders may not prove profitable in this connection, yet you place yourself in a good position to compete successfully for the trade. If a manufacturer becomes convinced that a profitable business would be obtained by complying with the wishes of his prospective foreign customers, he should not hesitate to swerve far from his present standardization in manufacture.

5. The American system of weights and measures is awkward, and used in but few foreign countries. Where possible the system in vogue in each country should be used, but for all ordinary requirements the metric system will be of the utmost value, as this has been adopted in almost all countries.

6. Your catalogue should be printed in English, French, German and Spanish. The extra cost is something, it is true, but it makes a vast difference in the catalogue as an order producer. A buyer likes to have everything as convenient as possible, and when it is remembered that in large cities abroad buyers are besieged by actual salesmen with samples ready to demonstrate their line personally in the buyer's own language at a price delivered in the buyer's city, you will realize the competitive value of a catalogue printed in an unknown language with the price in an unknown currency and frequently with delivery in some little town in the interior of the United States. If it be found worth while, the catalogue should be printed in the native tongue of each country. Prices should be in American, German, French and English currencies—certainly in English money, as this is readily calculated all over the world.

7. Directions for using, assembling or operating an article should be in very plain language, avoiding all local expressions, and should be printed in the native language of the country to which sent, whether this language be Hindustani or Swedish.

8. Pay particular attention to packing, as the means of transportation in foreign lands are diverse and often very crude. Detailed information on this subject should be obtained so that this most vital matter may be treated carefully. If export packing costs more in labor, material, &c., then simply add that to the price, but by all means give this question its proper consideration.

9. While actual credit—that is, open account—is hardly ever requested in foreign business, yet dealers must receive long dating on their drafts. This necessitates a thorough knowledge of their financial standing, for though you receive cash from the banks at time of shipping, yet you must trust the buyer to honor the draft when due.

10. Study carefully the best shipping routes and methods. In the first shipment to any country extreme care should be used to conform to every single requirement, as a simple omission may cause considerable annoyance to the buyer. A little inquiry in the proper places will evolve a knowledge of how to ship quickest, cheapest and safest.

11. It is usually bad policy to substitute in an order. Such a habit, which prevails freely in the United States, is stigmatized abroad. Therefore, unless specifically permitted to substitute, do not ship anything except the article ordered.

12. After establishing an agent in a place, protect him fully. Scrutinize every order that comes in and make certain that he is given credit for every bit of business coming from his market. Treat your agent as you would your partner, and never break faith with him, no matter what alluring offers may be made you from other sources.

13. Show only the deepest respect for the people of other countries. Feel that they are your equals in every way, and are entitled to the same kindly courteous consideration you tender your largest customers at home.

14. Do not be impatient for quick returns. A good export trade is the outcome only of the most patient, painstaking work, which frequently at the outset is keenly discouraging. Foreign trade must be fought for, but once you get into a market the business will usually be found more satisfactory than your domestic trade.

15. Arrange to have personal supervision over your foreign customers at all times. This may be effected in many ways.

While the above suggestions by no means cover the whole subject, yet they are the most essential features in building up an export trade, and a strict adherence to them will enable any manufacturer to secure the maximum amount of trade for his products in foreign markets.

* July 7, page 66.

A New Benefit and Pension System

Cheney Brothers' Plan for the Insurance of Employees Against Sickness, Accident and the Disability of Old Age

Organized co-operation between manufacturers and employees for the relief of workmen who are incapacitated through accident, sickness or the disability resulting from advancing years is increasing in a large way in this country. Many owners have for years acted with humanitarian motives in standing between their people and want, but until quite recently without systematized effort. The modern principle has been adopted by Cheney Brothers, South Manchester, Conn., in their plan, just announced, for industrial insurance and old age pensions. Briefly stated, the employee who becomes a member of the Benefit Association profits by insurance against sickness and accident and resultant death; by an annuity, paid from the income of a fund accruing from the contributions to the association; and by an old age pension paid by the company, independent of the association, but to members of the association only. The company undertakes the greater share of the expense of the system, and retains control of the conduct of the association by naming a majority of the Board of Trustees. In a statement by the company the economic side of the system is clearly set forth thus:

The Company's Statement

In the case of accidents, it is the replacing of a haphazard system, more or less dependent upon the varying discretion of department managers with a uniform system guaranteeing a just and equal treatment of each case. In a wider sense, it is a definite statement by the company of the general principle under which it has acted for many years—that injuries, so far as they are a necessary incident to industry, are a part of the cost of production and should be borne to that extent by the consumer, and not entirely by the injured person. The plan provides for a means of determining this factor of the cost of production more definitely, and of insuring both the company and the employees against it. In the case of sickness it is an extending of the company's past relief to individuals and tubercular patients so that it is not dependent entirely upon charity, but is an encouragement to the efficient and provident employees who are willing to make a sacrifice to secure the additional benefits guaranteed.

Both injuries and illness occasion a large economic waste to the company as well as to the employees, on account of lost time, idle machinery and ineffective work. It is to the direct interest of the company as well as the individual to bring about a re-establishment of health and consequently efficiency by supplying the best conditions possible for recovery.

In the case of pensions, the practice of the company has tended toward their bestowal in cases of necessity. The new regulation makes a pension dependent on the part of the company on long, efficient and faithful service; and, further, on the part of the employee upon his willingness, independently of it, to supplement his pension by a definite degree of providence on his own part in the form of an annuity. This makes a pension not so much a charity as an acknowledgment of the additional value of length and fidelity of service; it provides a pension for the efficient, thrifty employee as a matter of sound business policy, rather than to the less efficient and improvident hand as a matter of charity.

The Foundation of the System

The key of the whole system is that no employee is entitled to any of the benefits unless he or she, as a member of the association, shall contribute to the fund, though such contributions are applied only to sick benefits and to the annuities. The company adds 25 per cent. of the totals paid in by members, and in addition bears the entire expense of the accident benefits and the pensions.

Accident benefits will be paid to members who are injured in the service, but none will be paid where the accident results from the member's own willful and gross carelessness, or disobedience of rules reasonably designed for the protection of employees. The benefits follow:

(*a*) In case of death, three years' wages, and reasonable funeral expenses.

(*b*) In case of total incapacity, half pay during the continuance of disability, excepting the first three days, for a maximum of six years.

(*c*) In case of partial incapacity, after the resumption of work, one-half the difference between the wages earned before and after the injury. Such partial incapacity benefits continue for such part of the six years as the total incapacity benefits have not been paid.

(*d*) In all cases of accidents to members medical and surgical attendance, artificial limbs and hospital maintenance, where necessary, are provided at the expense of the company.

(*e*) One per cent. is added to the above accident benefits for every year of service over five; and in the case of married members supporting families, 5 per cent. for each child, until a maximum of 25 per cent. is reached.

Sickness and Death Benefits

The sick benefits will be paid from the contributions of the members, plus one-quarter of their totals, which will be paid in by the company. The members are divided into five classes, according to their average weekly wages. In case of sickness or injuries other than those suffered in the service of the company, they will receive one-half of the mean wage of their class for the first 52 weeks (excepting the first six days) and one-quarter for the second 52 weeks; and in the case of death one-half of the mean yearly wage of their class. The specific contributions and benefits of each class follow:

Schedule of Sick and Death Benefits.

	Class A.	Class B.	Class C.	Class D.	Class E.
Those receiving weekly—					
More than	...	$7.50	$12.50	$17.50	$22.50
Not more than	$7.50	12.50	17.50	22.50	....
Mean wage of class	$5.00	$10.00	$15.00	$20.00	$24.00
Benefit per week—					
First 52 weeks	$2.50	$5.00	$7.50	$10.00	$12.00
Second 52 weeks	1.25	2.50	3.75	5.00	6.00
Death claims	$130.00	$260.00	$390.00	$520.00	$624.00
Weekly contribution—					
2 per cent. of mean wage—full members	$0.10	$0.20	$0.30	$0.40	$0.50
*1¼ per cent—limited members	.06¼	.12½	.18¾	.25	.31¼

* Limited membership purchases not death claims or annuity.

Annuities

As to the annuities to which members will be entitled from the income of the accrued fund, they are payable:

(*a*) To men over 70 years of age and women over 60 years of age, who shall have been contributors to the fund for 10 years and who shall be retired from active service with the company.

(*b*) To men over 65 years of age and women over 55 years of age, who shall have been contributors to the fund for 15 years and who shall be retired from active service with the company because of incapacity for further work.

(*c*) To men or women of any age who shall have been contributors to the fund for 20 years and who shall have become permanently incapacitated for further work in the service of the company.

No annuities will be paid for 10 years, at the end of which time they will be approximately as tabulated below, class A being chosen as the basis, so that the amounts given should be multiplied by 2, 3, 4 and 5, respectively, to get the higher classes:

Monthly Annuities of Class A.

Age at retirement.	Years contributed. 10.	15.	20.	25.	30.	35.	40.	45.	50.
70	...	...	...	$1.60	$2.21	$2.98	$3.93	$5.12	$6.58
65	...	...	$0.83	1.19	1.64	2.20	2.89	3.75	...
60	...	$0.44	.67	.96	1.31	1.75	2.30	...	...
55	$0.22	.38	.57	.81	1.10	1.47	...	...	...
50	.20	.33	.50	.71	.96	...	...	...	...
45	.18	.30	.45	.63	...	...	...	...	...

Pensions

The pensions established may be granted by the company to the following classes of employees, if members of the association:

(*a*) To any employee over 50 years of age, who has been 25 or more years in the service, and who has become totally incapacitated for further work at any employment or trade; or to those employees as much younger than 50 as they have worked years more than 25, who have become totally incapacitated.

(*b*) To men, after 25 years of service, who are 70 years of age or over; or to men for the same term who are from 65 to 69 years of age, inclusive, and have become incapacitated for work of a like character to their past trade or employment.

(*c*) To women, after 20 years of service, who are 60 years of age or over; or to women for the same term who are from 55 to 59 years of age, inclusive, and have become incapicated for work of a like character to their past trade or employment.

The amount of the monthly pension will be determined by the employee's efficiency as expressed in wages and years of service, and is 10 per cent. of the average monthly wages for the 10 years preceding retirement plus 1 per cent. of the same amount for every year of service, as shown in the following table:

Estimate of Amount of Monthly Pensions for Various Rates of Wages and Terms of Service.

Average monthly rate of wages..	$36	$40	$45	$50	$60	$70	$80	$90	$100
Term of service. Years.	$	$	$	$	$	$	$	$	$
20	10.80	12.00	13.50	15.00	18.00	21.00	24.00	27.00	30.00
25	12.60	14.00	15.75	17.50	21.00	24.50	28.00	31.50	35.00
30	14.40	16.00	18.00	20.00	24.00	28.00	32.00	36.00	40.00
35	16.20	18.00	20.25	22.50	27.00	31.50	36.00	40.50	45.00
40	18.00	20.00	22.50	25.00	30.00	35.00	40.00	45.00	50.00
45	19.80	22.00	24.75	27.50	33.00	38.50	44.00	49.50	55.00
50	21.60	24.00	27.00	30.00	36.00	42.00	48.00	54.00	60.00
55	23.40	26.00	29.25	32.50	39.00	45.50	52.00	58.50	65.00

The World's Production of Pig Iron

James Watson & Co. of Middlesbrough, Glasgow, Liverpool and Swansea, have issued an interesting estimate of the world's production of pig iron. The totals in each case are compared with those of the previous year and of 1907:

	1907.—Tons.	1908.—Tons.	1909.—Tons.
United States	25,781,301	15,936,018	25,795,470
Germany	13,045,760	11,813,511	12,917,653
Great Britain	9,923,856	9,289,840	9,664,287
France	3,588,949	3,344,145	3,514,638
Russia	2,748,298	2,751,000	2,817,000
Austria and Hungary	1,789,165	1,952,750	1,947,300
Belgium	1,427,940	1,182,311	1,632,350
Sweden	603,400	563,300	443,000
Spain	380,580	430,000	420,000
Canada	581,146	563,672	677,000
Italy	148,200	80,000	147,000
Japan	42,919	147,217	150,000
India	40,000	38,000	39,350
China	62,148	66,409	74,000
Mexico	16,238	16,615	58,850
Totals	60,179,960	48,174,788	60,327,998

The McKenna Brothers Brass Company's New Agency.—The McKenna Brothers Brass Company, Pittsburgh, no longer represents the Firth-Stirling Steel Company, Demmler, Pa., for the sale of tool steels made by that company, but has recently taken on the line of tool steels made by the Vanadium-Alloys Steel Company, Latrobe, Pa., which recently completed its new plant. The latter company manufactures Vasco special carbon steel, Vanadium and Magnet steels and a new high speed steel known as Red-Cut-Special. In addition to the manufacturer's own sales representatives in New York, Philadelphia, Boston and Cleveland, the McKenna Brothers Brass Company will have traveling salesmen call on machine shops, automobile builders, structural plants, &c., in various parts of the country. William H. McKenna has charge of the tool steel department and is now perfecting his sales organization. A stock of all grades of tool steels made by the Vanadium-Alloys Steel Company will be carried in stock by the McKenna Company to facilitate filling orders promptly.

The Open Hearth—Electric Furnace

In an address on "What Electrochemistry is Accomplishing," at the seventeenth general meeting of the American Electrochemical Society, in Pittsburgh, May 7, 1910, Dr. Joseph W. Richards spoke as follows regarding the open hearth and electric processes of making steel:

The open hearth furnace is, at present, the most important of the methods of manufacturing steel—"tonnage steel." It makes steel from pig iron and scrap of proper quality, or from pig iron and iron ore (mill scale), or from pig, scrap and ore. It makes its best steel on silica hearths from high grade material low in sulphur and phosphorus, and its cheapest steel on basic hearths from almost anything. The electric furnace can do any or all of these things, and, as a general proposition, produce better steel from given material than the open hearth furnace. Under what circumstances it will pay to use the electric furnace instead of the open hearth furnace would take at least one lecture to discuss; we will not go deeply into it here. In Europe, countries which have very cheap water power, around $10 per horsepower year, and fuel costing $4 to $6 per ton, are finding the electric furnace the cheaper; with power costing $20 and coal $5, the two are about on equal terms; in Pittsburgh, with power at $30 and coal at $1, the open hearth furnace is by far the cheaper for producing such steel as it can produce.

However, even here the combination of Bessemer and electric furnace is possibly cheaper than the all open hearth process; the combination of open hearth and electric furnace processes is quite possible and practicable, to produce crucible quality steel on a large (tonnage) scale, and the combination of the open hearth and electric furnace into one furnace is not only a possible combination, but is actually being "tried out." The latter idea is to take an open hearth furnace and to place electrodes in the roof. The furnace is run as an ordinary open hearth furnace, with the electrodes withdrawn; and at the close of the open hearth heat gas and air are shut off entirely, the electrodes lowered into proximity to the bath and the heat finished as an electric furnace heat. The idea is sound and practicable, and will result in the production of better steel than can be obtained from any open hearth furnace, at but a slight advance on the cost of the open hearth steel, say $2 to $3 per ton.

As to the capacity for enlargement of electric steel furnaces, they started out to duplicate the crucible steel process, producing 100 lb. of melted steel at a heat, and in eight years have risen to 15 tons capacity. In Europe an electric calcium carbide furnace of 18,000 kw., capable of producing 200 tons of carbide daily, is in practical operation. A furnace of like power capacity could be built to make steel, and would be a 200-ton furnace or larger. We can, therefore, say with assurance that, with a little more experience and experiment, electrometallurgists will be able to furnish the steel maker with electric steel furnaces as large as are wanted—up to 200 tons capacity if desired.

The electric manufacture of steel is coming upon you in Pittsburgh, surely and quickly. It will be an immense industry, and will bring with it corresponding power and wealth. It will call for the best efforts of your mechanical engineers, metallurgists and electrical engineers, aided by electrometallurgists whom you must either bring in or develop yourselves.

The year 1910 will be historic in your annals, because of the great awakening to your advantages as an electrochemical center and from the fact that future historians will record: "In that year electric manufacture of steel was first begun in the Pittsburgh district on a commercial scale."

A Unique Exposition of Machinery

The National Machinery Company Demonstrates to Its Guests a Wide Line of Bolt, Nut and Forging Equipment

The National Machinery Company, Tiffin, Ohio, gave an exposition of a full line of bolt, nut and forging machines at its works, Monday and Tuesday, August 22 and 23, and entertained a large and notable gathering of manufacturers and their engineers and practical shop men, together with representatives of the mechanical departments of some of the great railroad systems. A large proportion of the visitors stayed the two days, for the reason that a briefer study of the equipment would have been inadequate. The company had made every preparation for the care of its guests. The large, highly lighted main building was an excellent exposition hall. Manager E. R. Frost took personal charge of affairs and had a capable corps of assistants, including the members of the large selling force and skilled demonstrators who gave to the interested investigators a comprehensive idea of each individual tool.

It is doubtful if precedent exists for a method of presenting such a broadside of announcements of new machinery to the trade. More than 50 different types and sizes of tools were on the floor, many of them in producing operation. All were new, either in their complete form, or in improved design, with refinements of construction and mechanism to increase their general efficiency. New sizes have been added to make complete an equipment for the manufacture of nuts, bolts and rivets, and for general forging and upsetting. Most interesting of all were the new types shown in operation, comprising a 1½-in. vertical roll threading machine; a 3½-in. heading, upsetting and forging machine; a lag screw pointer; a six-spindle semiautomatic nut tapper; a nut burring machine, and a die sharpening machine for grinding bolt cutter and other threading dies. A new ½-in. wedge grip continuous motion rivet header attracted much attention. A new friction slip flywheel is embodied in the headers. Another novelty of the new line is a four-head bolt-cutting machine, designed primarily for railroad shops and other similar works, the idea being that several sizes of bolts may be cut at a single setting.

The Heading, Upsetting and Forging Machine

The 3½-in. heading, upsetting and forging machine is intended to supply the needs of railroad and bridge shops and other plants where various forging operations as well as bolt work must be handled. The construction is massive; the total weight is 48,000 lb. The machine has direct motor drive, connection being through a rawhide pinion. The bed is a semisteel casting, with a distribution of weight which gives great strength and stiffness. Removable wearing plates are placed under and at the sides of all the reciprocating slides, preventing wear upon the bed.

The starting clutch, operated by a floor treadle, is of the double cushion type, affording two opportunities to start the machine during each revolution. One or more revolutions may be made as the operator shall direct. When the foot is removed from the treadle a friction brake automatically stops the machine on the back stroke, with the grip dies open. The grip die slide is operated by toggles and a toggle slide actuated by chilled cams on the main shaft, and as the shear on the side of the machine is a part of the grip slide casting, the slide has bearing surfaces on both sides of the die box, insuring a smooth parallel movement and tending against cramping and wear. The toggle slide carries two large chilled rolls against which the cams operate. The rolls being adjustable and toggles backed by an adjustable wedge, the position and movement of the grip slide may be adjusted with nicety. Shearing pins as safety devices are provided on both heading and gripping slides. The speed of the machine is 40 strokes a minute, the ratio of gearing 4½ to 1, the width of belt 12 in. and the floor space required 10 ft. 8 in. by 12 ft. 4 in.

The Vertical Roll Thread Machine

The 1½-in. vertical roll thread machine presents interesting features, several of them radical departures from the standard practice. It is a massive tool, weighing 28,000 lb., rigid throughout to eliminate any tendency to spring of the parts which back up the dies. The machine will roll threads 1½ in. in diameter by 4 in. long, 1¼ x 5 in. and 1 x 6 in. The customary flat dies are used in a vertical position, which permits the lubricant to flow freely and thoroughly and to keep the dies free of scale, insuring a perfect, well filled thread. The slide is backed by a train of hardened steel rolls, which are actuated by a gear and rack at the top, giving a smooth movement and requiring less power for operating.

The Six-Spindle Nut Tapper

The 1-in. six-spindle semiautomatic nut tapper was shown for the first time, being the first of its type to be built. The spindles are raised and lowered automatically by means of cams on a back shaft, which is actuated by differential gearing from the driving shaft. The raising and lowering motion as well as the resting time of the spindles are variable quantities, being determined by the adjustment of the cams. The feature is valuable in procuring the maximum speed of operation, for the machine can be set for the producing limit of the operator, and thus made to set the pace for him. The cams are timed so that the spindles act in succession. The operator has but to slide the blank into position for tapping and to remove the finished pieces from the tap shank where they accumulate. The taps being held in a spring collet are released automatically should there be an excess of threaded nuts.

The Nut Burring Machine

The 1¼-in. semiautomatic nut burring machine is a new type also built in the 2-in. size. It is designed to remove the rough edges or burr from all sizes of United States standard square and hexagon hot pressed nuts from ⅝ to 1¼ in. The operator has only to place the nuts in a slot and move them forward. The raising and lowering of the spindle and the feeding of the nuts to the position under the cutters are automatic. The machine and not the workman determines the rate of production. An injector moves the nut to position under the cutting head, where it is burred on the downward movement. The head raises, the operator moves forward the row of nuts in the slot, and the next incoming nut ejects the finished piece. A new type of burring head is employed, carrying four cutters, one of which acts to remove any fin which is turned over the edge by the action of the other blades. Safety reliefs are provided upon the vertical movement of the burring spindle and on the injector, and a compensating spring takes care of any variation in thickness of the work. The machine requires a floor space of 3 ft. by 4 ft. 4 in., the net weight is 2200 lb., the width of belt 4 in., and the countershaft speed 310 rev. per min.

Lag Screw Gimlet Pointer

The ½-in. lag screw gimlet pointer, which is also built as a ¾-in. machine, points and threads blanks at a single operation at the rate, per 10-hour day, of 8000 ½-in. bolts, 12,000 ⅜-in. and 15,000 ¼-in. bolts under manufacturing conditions. Its capacity in length is 12 in. The rough blank is inserted in a revolving spindle, and a hand lever brings the carriage containing the cutting die across the end of the bolt, forming the gimlet point, the sharp tip being retained, which permits the screws to be started by hand in hard wood. The operation completed, the carriage returns to its idle position and the blank drops out. The thread is formed at the point only. The body of the bolt goes to the regular bolt cutter. The cutting tool is cylindrical in form, cut away longitudinally of its axis, and its life is long, because sharpening may be continued until the cylinder is cut away through almost its entire circumference. The main spindle runs in self-oiling bearings of large proportions. The finished work drops from the machine into a receptacle, while chips and oil pass to a removable chip pan, whence the oil drains to its reservoir.

Die Sharpener

Much interest was taken in the National die sharpener, a tool designed to scientifically sharpen precision bolt cutter and other threading dies. The purpose is to replace the slower hand grinding and at the same time to secure uniformity of product, so that all tools in a set will work alike. Provision is made, with micrometer indexes, to give any angular adjustment of the work to the grinding wheel. One size wheel, 6 in. in diameter, is used.

Wedge-Grip Continuous-Motion Rivet Header

The ½-in. wedge grip continuous motion rivet header, which follows the general design of the ¾, 1, 1¼ and 1½ in. sizes, is recommended for all styles of single blow work, such as rivets, track bolts and carriage bolts, and will cut off and head simultaneously all sizes up to ½ in. in diameter and 6 in. long. The speed of the machine is 80 rev. per min., its floor space 4 ft. 2 in. by 6 ft. 3 in., the net weight 10,250 lb. and the width of belt 5 in. The feature of the type is the gripping mechanism, which is designed to act without undue strain on the face of the dies. The gripping slide is actuated by a sliding wedge bar, having a contact area of large size to permit complete lubrication. The wedge is driven by a simple toggle movement connecting with the heading slide. The one-pitman crank which drives the machine connects directly with this slide. The bed is a semisteel casting, heavily constructed to avoid spring. Removable liners prevent wear on the bed. The large bearings of the main shaft are of the split removable type, having ring oilers, and the caps are tongued into the bed. The steel pitman is of the locomotive type, with gib and taper key for adjustment and with phosphor bronze boxes. Removable wearing surfaces are provided on the faces of the gripping wedge, and steel protects all faces of the die seats. Automatic safety relief for the gripping dies acts up to the time the dies are closed, when the grip becomes absolute. After relieving the machine the relief resets itself automatically, it being unnecessary to stop the machine. An improved stock gauge can be adjusted while the machine is running, by the turning of a stationary hand screw.

Railway Blacksmiths Entertained

The National Machinery Company entertained the International Railway Blacksmiths' Association at the works August 19. The association concluded its annual convention at Detroit, Thursday and Friday mornings, the members and their families to the number of 300 boarded the company's special train, which made a record run ahead of the Twentieth Century Limited. Arriving at Tiffin special cars conveyed the guests to the Auditorium, where luncheon was served them. In the afternoon the men of the party were taken to the works, where they enjoyed the exposition, while the ladies and children went to Meadowbrook Park, where a band concert and games provided entertainment. A supper at the Auditorium preceded a carriage drive to the special train, which took the party back to Detroit.

The World's Production of Coal in 1908

Prof. R. A. S. Redmayne, Chief Inspector of Mines of Great Britain, in Part IV of the Home Office Report and Statistics, presents the following table of the production of coal in the world in 1908:

Country.	Metric tons.
Great Britain and Ireland	265,725,704
Australia	10,357,218
British Borneo	98,712
Canada	9,875,902
Cape Colony	111,461
India	12,974,558
Natal (including Zululand)	1,696,570
New Zealand	1,890,839
Orange River	402,230
Rhodesia	148,881
Transvaal	2,733,071
Total for British Empire	306,015,146
Other countries:	
Austria-Hungary	48,966,222
Bosnia and Herzegovina	659,962
Belgium	23,557,900
Bulgaria	162,992
Chile	939,836
China*	†8,890,000
Corea	†5,895
France	37,384,384
Indo-China	347,000
German Empire	215,286,349
Holland	908,201
Dutch East Indies	432,923
Italy	480,029
Japan	14,825,363
Formosa	‡92,042
Mexico	1,024,579
Peru	§185,565
Philippine Islands	10,035
Portugal	4,614
Roumania	100,783
Russia	25,059,100
Servia	293,125
Spain	4,118,276
Spitzbergen	2,464
Sweden	305,206
Switzerland	‖ 5,000
Turkey	771,203
United States	377,250,021
Venezuela	†14,064
Total for other countries	762,143,133
Total for the world	1,068,158,279

* Output from certain Provinces only. † Figures for 1906. ‡ Output for Kelung district only. § Figures for 1907. ‖ Estimated.

George J. Hagan, People's Bank Building, Pittsburgh, furnace engineer and contractor, has been awarded a contract for a Hagan 8 x 16 ft. four-door heating furnace to be installed in the guide mill of the Sligo Iron & Steel Company, Connellsville, Pa. This company has a stock of bar iron ready for prompt shipment and reports business good. The American Rolling Mill Company, Middletown, Ohio, has contracted with the American Stoker Company, New York City, for 24 stokers, to be used in firing the sheet and pair furnaces installed by Mr. Hagan some time ago. Mr. Hagan is the sales representative for the American Stoker Company in Pittsburgh and vicinity.

W. Ames & Co., proprietors of the Jersey City Spike & Bolt Works, Jersey City, N. J., state that the fire which recently occurred in their plant destroyed only the rolling mill building and not the entire works. They are still operating their spike and bolt factory. Their new plant on Communipaw avenue, Jersey City, will be started in about one month's time.

The Influence of Galvanizing on the Strength of Wire

At the International Congress of Metallurgy, held at Duesseldorf recently, Dr. Heinrich Winter of Bochum read an elaborate paper on the above subject. Particularly in mine installations is it important to protect the hoisting ropes by a suitable rustproof covering. Coating with zinc has been found to answer the purpose admirably, for the protection afforded depends upon the formation of a couplet in which the zinc of the galvanized iron forms the electro positive element and the iron the electro negative, when the material is immersed in water or other fluids. The zinc takes up oxygen, gradually forming a zinc oxide, while on account of the evolution of hydrogen the iron remains inert even if the continuity of the zinc coating is slightly broken.

In the process of hot galvanizing there is no question, however, but that the strength and particularly the resistance to bending and torsion are considerably affected, and the purpose of the paper in question was to determine the degree of this action. Many theories are given regarding the loss of tensile strength. Poor material is cited, but tests have shown that even the best of material suffers loss. Again, the steel is supposed to have been "overdrawn," but microscopic tests do not show signs of this in materials losing 28 per cent. of resistance to torsion effects. Finally, irregularity in the coating of zinc is supposed to change the resistance to torsion, by obstructing the power applied in varying degree in the test piece. This also will not explain the situation, for many wires with uneven coats of zinc showed practically no deterioration in this regard.

How Tests Were Made

To study the matter carefully, the first thing was to note whatever changes might be produced by the drawing down of the billet to wire. Twelve test pieces were therefore cut from the material from the original billet down to the actual wire, pickled and galvanized, but not annealed. These sections represented the various stages through which the material went, and were etched by immersion in a copper-ammonium-chloride solution (1:12) for one minute each, the copper deposited being carefully wiped off with absorbent cotton while under water. The lighter outer zone as distinguished from the darker inner zone, showing segregation, could be followed plainly through the whole series made from this billet. Further etching with an alcoholic solution of picric acid (1:25) for 15 minutes indicated that the grain of the inner higher phosphorus zone was larger than the outer one with lower phosphorus. The results of the physical tests on the material showed the usual phenomena, an increased ultimate strength, with brittleness to a point to almost wipe out the power to twist it in the final wire before further heat treatment.

In order to not disturb the zinc layer in making sections for polishing, the wire was first cleaned carefully with alcohol and ether, placed in a solution of copper potassium cyanide, and a weak current applied to coat it with copper. It was then washed with alcohol and ether, and finally melted into Rose's alloy, which on account of its low melting point gave a perfect protection for the galvanizing coat, and yet did not alter the microstructure of the material. Finishing up the polished sections with a very little rouge on parchment paper with a 2 per cent. solution of ammonium nitrate for five minutes, thus etching them, gave excellent results. With 125 diameters enlargement the makeup of the section is plainly shown. A dark band for the zinc, light for copper and black for the Rose metal, with lighter color for the steel. A separate band may be distinguished between the iron and the zinc coat.

Absorbed Hydrogen Gas Does Damage

This material, it should be remembered, was pickled before galvanizing. Hence many investigators brought back the brittleness of galvanized steels to an absorbed hydrogen from the acid bath. This absorbed gas can, therefore, do considerable damage. Further investigations, however, have shown that heating the steel up to 250 degrees F. for four hours removes this effect entirely. Hence, inasmuch as the microscope does not show any indications of an iron hydroxide either there remains only the theory that between the zinc and the iron there is a layer of an iron-zinc alloy, formed either because the wire was left in the zinc both too long in contact with the zinc, or that the bath was too highly overheated. That such an alloy exists is well known, every galvanizer being worried by large amounts of "dross," which contains 3 to 5 per cent. iron, and is a very brittle material. On the other hand, in order to get the zinc coat to stick to the iron, it is necessary that such an alloy be made with the iron, the composition varying from high zinc at the contact to no zinc a little distance into the iron, as was clearly shown by Sherard Cowper-Coles.

A study of the structure of the material before galvanizing shows that where this is large grained and easily to be penetrated, much zinc gets in. Even where the microscope does not show the layer of the zinc-iron alloy, it is undoubtedly there as a very fine one, and depending upon the extent of this layer will be found the phenomenon of loss in power to bend and twist when taken in connection with the change in structure through the heat treatment. It is well known that with soft steels the elasticity is changed with temperatures as low as 750 degrees F., but it also takes some time to do this. Hard drawn steel would consequently become softer by remaining in the bath longer, but this gain will quickly be offset by the formation of a heavier layer of iron-zinc alloy.

The conclusion of the paper is that the wire industry is perfectly capable of furnishing galvanized wire which has not suffered seriously as to its physical properties, this being a question of proper practice in regard to removal of damage done by pickling, and proper bath temperature and time of the wire remaining in it. It is, therefore, necessary to treat the wire before galvanizing to remove the hydrogen absorbed and to regulate the temperature of the zinc bath between close limits. The latter is not easy, as there are difficulties in pyrometry and also in the proper firing where many wires are passed through constantly with consequent irregular lowering of the temperature.

R. M.

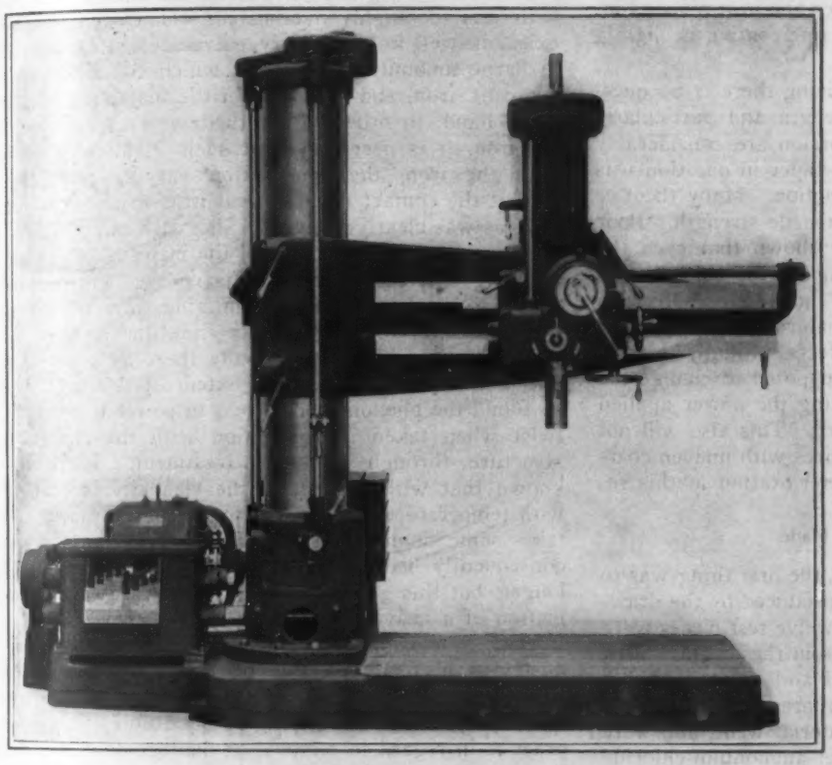
Cholera Hurts the Russian Iron Trade.—The epidemic of cholera now raging in Russia is having a serious effect on its iron trade. A cablegram from St. Petersburg, under date of August 25, says: "The Minister of Commerce to-day called a meeting of the metallurgical industry to discuss a proposal for the temporary free importation of pig iron to relieve the iron famine and reduce excessive high prices. Iron manufacturers in the St. Petersburg, Moscow and Riga districts have complained that producers in South Russia are unable to fill contracts. They give as the reason the desertion of their mines by workingmen, who are fleeing *en masse* from the cholera." On the following day advices were more cheerful. The iron manufacturers reported that their workmen were beginning to return to the mines in considerable numbers. The proposal to reduce the duty on pig iron had a particularly good effect in spurring the employers to take measures to combat the exodus of the workmen.

The Cincinnati Bickford No. 2 Plain Radial Drill

A 5-Ft. Model, the First of a New Line

For some time the Cincinnati Bickford Tool Company, Cincinnati, Ohio, has been working upon a new line of radial drills, and the No. 2 machine illustrated herewith is the first of the line to be completed. These drills are made with three lengths of arm, 4, 5 and 6 ft., respectively, the middle size being the one shown.

To resist the torsional and bending strains from the upward pressure on the spindle when heavy drilling is being done, the arm is of pipe section and proportioned at all points according to the load, so that as a whole it possesses a degree of strength unequaled by any other form of construction. Two binder handles shown in the engraving are provided for clamping the arm to the column. The arm can be rapidly raised and lowered by power, the latter motion at a speed twice that of the former. The column extends to the top of the sleeve, and is internally ribbed to add to its stiffness. It is bolted to the base, giving it exceptional rigidity and eliminating vibration, both of which are essential to the production of high class work. It is fitted with two ball bearings, one of which carries the weight and the other the side pressure of the swinging members.



The New 5-Ft. Plain Radial Drill with Style F Motor Drive, Built by the Cincinnati Bickford Tool Company, Cincinnati, Ohio.

The head is a decided departure from customary practice, and is conspicuous for the length of its bearings, the simplicity of its construction, the durability of its wearing parts and the convenient position of the operating levers. The back gears are incorporated in the head, and can be engaged or disengaged while the machine is in motion. These gears furnish three changes of speed at each of which more than two and one-half times the pulling power of the next faster one can be transmitted to the spindle. The reversing clutch is operated from the front of the head. This is of the familiar toggle joint type, and at its lowest speed is capable of transmitting power far in excess of that obtainable from the belt.

When the drill is fitted with a speed box, as shown, 24-spindle speeds are available, and when fitted with a cone pulley 15 are available. These are correct for cutting speeds of approximately 35 ft. per minute for diameters of from 7-16 to 6¼ in., the range being from 21 to 306 rev. per min. The speed box is operated by a single lever, which furnishes any one of eight changes when moved to the corresponding notch. The figures on the plate below the notches give the proper settings for the different diameters of drills. The spindle sleeve has an unusually long bearing in the head, and exerts pressure on the spindle through a ball thrust bearing. A safety stop is provided for tripping the feed within the limits of its movement, and the quick return lever controlling the vertical movement of the spindle engages the feed the instant it is pulled. A convenient means for regulating the amount of expansion of its friction ring is also provided. The depth gauge is graduated to read in either sixteenths up to 6 in., or in millimeters up to 150, and may be set to trip the feed at any desired depth within these limits. Eight changes of feed in approximately geometrical progression are provided for each spindle speed. These range from 0.006 to 0.03 in. per revolution of the spindle, and any one of these feeds can be substituted for any other while the machine is in motion by the maker's standard lever operated dive-key.

The gearing throughout the machine is of such pitch, face and material as to insure long life under continuous duty at the horsepower recommended by the builder. It is completely encased throughout, and in no instance does the peripheral speed exceed 1000 ft. per minute. The base is unusually heavy, especially where the column is bolted to it It is provided with ribs and cross ribs and also large T-slots. The plain box table, shown in the illustration, is also provided with T-slots. These machines can be equipped with the builder's style E or style F motor drive, the latter being the one shown.

The following table gives the principal dimensions and specifications of the drill:

Hight of base, inches	8
Size of working surface of base, inches	42 x 63½
Vertical range of arm, inches	42
Horizontal range of head, inches	48⅝
Maximum distance of spindle above base, inches	72
Minimum distance of spindle from base, inches	12
Diameter of column, inches	14
Total hight of column from floor, inches	112⅝
Diameter of spindle at least section, inches	2¾
Vertical range of spindle, inches	18
Morse taper of spindle	No. 5
Working surface of table, inches	21 x 28
Hight of table from base, inches	22
Speed of motor, revolutions ptr minute	1,200
Horsepower required	7½
Weight (net), pounds	12,150
Weight (domestic shipping), pounds	12,400
Weight (foreign shipping), pounds	14,000

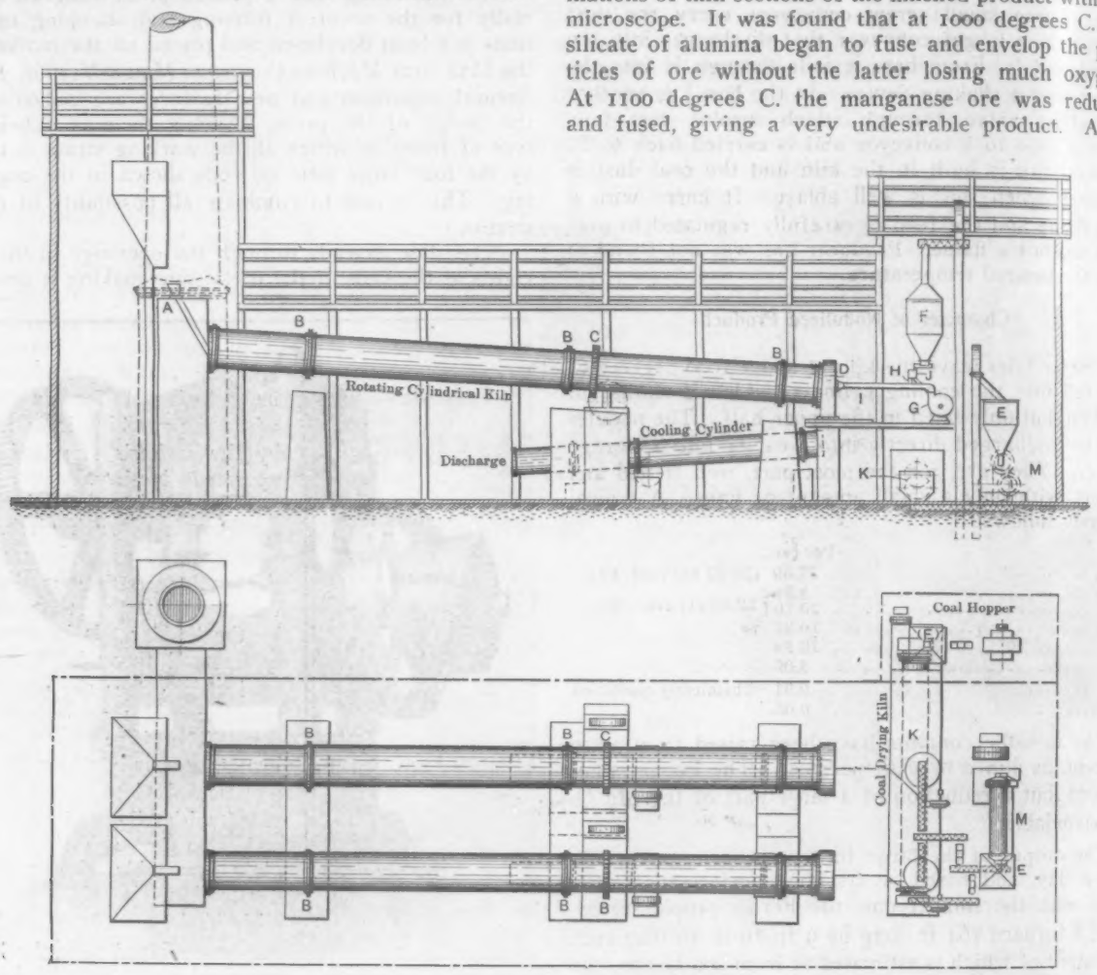
In a series of tests made on this drill at the builder's shop for driving drills of various diameters at various speeds and feeds in cast iron, it was found that while some of the tests consumed as much at 16.5 hp., it is nevertheless preferable that the size of the motor be limited to 7½ hp., as such a motor can be relied upon to deliver an overload of 50 per cent., or 11.25 hp. This is sufficient power to permit a feed of 0.03 in. for all sizes of drills up to and including 2½ in. and a cutting speed of 70 ft. or over to be used.

Nodulizing Wet Iron Ores

The Process in Use at the Fernie Works in Germany

In the issue of *Stahl und Eisen* for May 4, 1910, is an article on "The Nodulizing Process at the Fernie Works, near Giessen," as applied to a soft brown iron ore. It is written by Friedrich Witte, and is abstracted below:

This process has been used at the Fernie Works for about a year, and is being applied successfully at Teschen, Austrian Silesia, to the treatment of flue dust, fine spathic ore and pyrites residues. The ore treated at Fernie contains nodules and pieces of pyrolusite and a considerable amount of silicate of alumina. The analysis of an air dried sample is as follows:



Iron Ore Nodulizing Plant with Two Rotary Kilns at the Fernie Works, near Giessen, Germany.

	Per cent.	
Fe_2O_3	31.96	(22.37 per cent. Fe)
MnO_2	29.04	20.54 per cent. Mn.
MnO	2.82	
Al_2O_3	9.35	
SiO_2	12.97	
P	0.08	
H_2O	8.09	Chemically combined.
CO_2	0.44	

The ore as mined contains from 20 to 30 per cent. water, averaging 25 per cent., so that the metallic contents would be 16.78 per cent. Fe. and 15.41 per cent. Mn. The high moisture of the ore and its unfavorable condition for smelting caused the management to try experiments for years, leading to enrichment and improvement before shipment. It was thought that briquetting would be a success, owing to the large amount of clay in the ore, but this was found to be too expensive and did not give a good product. Experiments were then made at Frankfort-on-the-Main with a small cylindrical rotating kiln (of the same type as those used in cement works) by Fellner and Ziegler, who have made application for a patent on the process. It was found that all the water could be expelled, and the ore furnished in solid but porous pieces, very suitable for furnace work. Following the experiments a furnace was built at Fernie, and after many difficulties a practical process was developed, after which a second furnace was built 114 ft. 10 in. long by 7 ft. 10 in. in diameter.

Mr. Esch wrote of the difficulties in the summer of 1908. The chief one of them was to find the exact temperature to give nodulizing without fusing. Careful pyrometric measurements were made, and many examinations of thin sections of the finished product with the microscope. It was found that at 1000 degrees C. the silicate of alumina began to fuse and envelop the particles of ore without the latter losing much oxygen. At 1100 degrees C. the manganese ore was reduced and fused, giving a very undesirable product. After many trials it was also found that if the ore were exposed to the highest temperature for about 13 ft. of travel the right product was obtained.

Construction and Operation of Plant

Herewith we show an elevation and plan of a two-furnace plant as used at the Fernie Works. The charge, as uniform as possible, is introduced through a feed pipe at A. It slowly works its way down the kiln, losing its moisture and being nodulized at the hottest part of the furnace. The kilns, which are inclined at 6 degrees, are nearly 115 ft. long by 7 ft. 2½ in. in diameter; they are made of riveted boiler plate and lined with firebrick. They are provided with three steel rings, B, supported on two rollers of cast steel. Both furnaces are revolved at a speed of one revolution a minute by a geared ring, C, using one 40-hp. motor. The furnaces revolve at the lower end in a frame, D, that permits of the nodules dropping into the cooling cylinder below. The frame can be removed for repairs to the kiln.

The kilns are fired with pulverized dried coal, the coal coming from Westphalia. It is first dried in a

kiln, K, similar to the nodulizing kiln, 49 ft. 2 in. long by 5 ft. in diameter. It is smooth inside, with no lining, and makes three revolutions per minute. It is inclosed in brickwork, in which it is heated by means of a grate fire. The dried coal is elevated to the hopper E, above two grinding mills, M. From here the dust is elevated and discharged into the hoppers F, from which the kilns are fed by means of the fan G, the pipe I and the dust feed J. The fan at 800 rev. per min. gives about 3500 cu. ft. of air, at a pressure of from 2⅜ to 2¾ in. of water. The pipe I tapers from 14 to 10 in. in diameter at the entrance to the kiln. The coal dust is fed into the pipe at H and may be regulated as follows: Three small screw conveyors carry the dust from F to a larger conveyor that discharges into the closed box J. From here it falls through H into the pipe I over a shaking device. In the box J is another controlling valve, through which surplus dust falls down a pipe to a conveyor and is carried back to F. A wood fire is built in the kiln and the coal dust is admitted when this is well ablaze. It burns with a long flame and the feed is carefully regulated to prevent too hot a flame. Producer gas was not found to give the desired temperature.

Character of Nodulized Product

The nodules leave the kiln at about 1000 degrees C. and fall into the cooling cylinder, which is similar to the kiln, but only lined in the upper half. The nodules may be discharged directly into a car or into a storage hopper. They are, for the most part, well fritted and porous, with only a small amount of fines. A typical analysis follows:

	Per cent.	
Fe_2O_3	37.59	(26.31 per cent. Fe)
MnO_2	9.91	22.30 per cent. Mn.
MnO	20.70	
Al_2O_3	10.31	
SiO_2	15.94	
P	0.09	
H_2O	0.31	Chemically combined.
CO_2	0.05	

The metallic contents have been raised from 32.19 per cent. as mined to 48.61 per cent. The Fe_2O_3 is not reduced, but a reduction of a large part of the MnO_2 is unavoidable.

The output of the large furnace is from 120 to 180 tons a day, and based on its good performance compared with the smaller one, the Fernie people recommend a furnace 164 ft. long by 9 ft. 10 in. in diameter, the output of which is estimated at from 200 to 250 tons per 24 hours. The greatest difficulty in operation is an annular growth of fused material in the hottest part of the kiln. It is due to too high a temperature and to nonuniformity of the charge. The removal of such a ring is said to cause a shutdown of only four or five hours.

The power consumption at the Fernie Works is 170 hp., distributed as follows: One 40-hp. motor for the kilns, two 15-hp. motors for the fans and 100 hp. for the coal drying cylinder, grinding mills and conveyors. The coal dust consumption amounts to 12 to 15 per cent. of the nodules produced. It is believed this can be reduced to 10 per cent. in the large kiln proposed. This is important, as this is the chief item of cost. The cost of such a plant in Germany will be about $50,000. With an output of 60,000 tons per year, using 10 per cent. of coal dust, 140 hp., four men for each shift, and German prices for labor, fuel and power, the cost is expected to be 63 cents per ton of nodules, including everything.

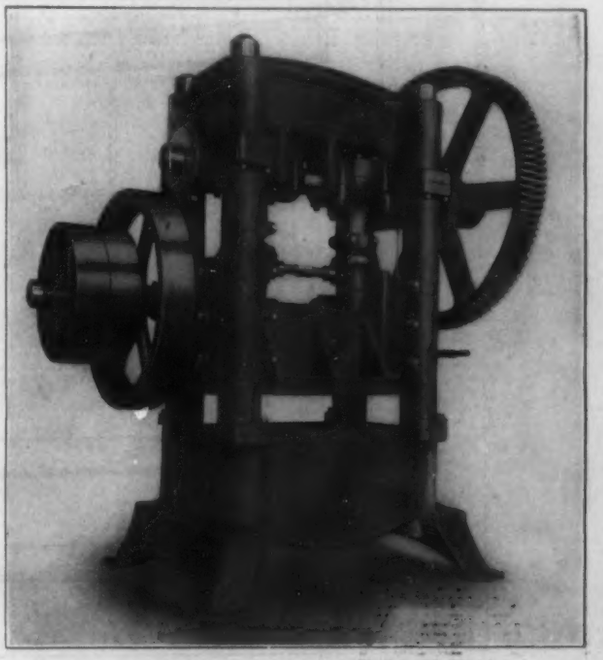
The paper closes with a careful calculation of the economy of employing the process and the much greater suitability of the product for furnace use. The plant at Teschen, mentioned before, has obtained the following results with pyrites residues and fine spathic ore. Pyrites residues containing 64.18 per cent. Fe. and 2.94 per cent. SiO_2 showed after treatment 65.23 per cent. Fe. and 4.17 per cent. SiO_2. The spathic ore has 31.81 per cent. Fe., 6.70 per cent. Mn. and 7.49 per cent. SiO_2. After treatment it had 45.58 per cent. Fe., 10.99 per cent. Mn. and 11.30 per cent. SiO_2.

The process is seen to be very similar to at least two so-called nodulizing or sintering processes that are in successful use in the United States. G. B. W.

A New Max Ams Double Pitman Press

An interesting double pitman press designed especially for the severest forming and stamping operations has been developed and placed on the market by the Max Ams Machine Company, Mount Vernon, N. Y. Several important and new features are embodied in the design of the press. Among them is a built-up type of frame in which all the working strain is taken by the four large steel tie rods shown in the engraving. This is said to eliminate all possibility of overstrains.

The slide extends through the openings in the uprights at the ends of the press, thus making it possible



The No. 1015 Double Pitman Press, Built by the Max Ams Machine Company, Mt. Vernon, N. Y.

to utilize the entire surface of the bed and to handle sheets measuring 20 x 48 in., although the distance between the uprights is only 34 in. When feeding material from front to rear sheets 25 in. square can be taken care of easily.

Bearings located on either side of the double pitman connections serve to support the double eccentric shaft rigidly. The eccentrics themselves are formed as solid enlargements of the shaft, which allows them very large bearing surfaces. One advantage claimed for this press is that the working strains are taken up directly by the main frame instead of the cranks, which is generally the case, thus eliminating springing and avoiding uneven wear. The clutch controlling the operation of the press is solid with the shaft, and is practically noiseless in its action as well as strong and durable.

The tight and loose driving pulleys are 28 in. in diameter by 6-in. face. The ratio of the gearing is 8½ to 1. The flywheel weighs 1100 lb., and the complete press 20,000 lb. Parallel adjustment of the slide, strong pitmans and all the other features common to this type of press are embodied in its construction.

Blast Furnace Charging Abroad

The Use of Wire Rope Cableways in European Plants

BY DR. ALFRED GRADENWITZ, BERLIN, GERMANY.

There are two distinctly different means for charging blast furnaces, one using the skip hoist and the other the wire rope railway. The former consists of raising the raw material from some point close to the blast furnaces to the furnace mouth by a hoist inclined at an angle of 55 to 70 degrees, and dumping it from an automatically discharging bucket. This process can be used only where the space immediately surrounding the furnace is unoccupied; and, moreover, it is at least desirable that elevated tanks for ores, limestone and coke should be installed in the immediate neighborhood of the furnaces, preferably parallel to the latter. Transporting material on wire rope railways, on the other hands, affords the possibility of discharging immediately into the furnace without any transfer from distant places. Several blast furnaces can be connected together by light bridges to avoid interruption of operation due to a local or partial breakdown in service. In this case the discharging operation no longer occurs automatically.

A decided advance over the use of wire rope railways was made by the design of electrically propelled suspended railways which have been found an excellent means of conveyance in the case of lines comprising many curves and branch lines. The trucks of these suspended railways are even able not only to discharge, but to charge themselves automatically.

The latest development in this line is a combination of a suspended railway with the wire rope railway principle. At the beginning of the ascent the electrically propelled suspended railway trucks, as they arrive at regular intervals, are coupled automatically to the traction cable of the blast furnace wire rope railway and thus drawn up the incline, while the current supply is discontinued. On arriving at the charging platform they are automatically uncoupled, while their contact bows are again applied to the live wire, and thus they continue their way automatically and are discharged at the blast furnace mouth by tilting. The trucks then return to the incline, where they are coupled automatically, and after traveling down the traction rope are uncoupled and proceed to the storage bunkers. Manual labor is required in this case only for lifting the hopper valves in loading the trucks and for tilting the trucks into the furnace mouth. Some men are further required for superintending the amounts of material conveyed and distributing them to the furnaces.

This system lends itself to solving the most difficult problems. It is practically independent of the original arrangement of the plant, the raw material bunkers being installed at any distance from the blast furnaces, even other buildings being situated in the intervening space. While the number of trucks required for dealing with the plant obviously increases as the distance increases, the output and wages remain strictly unaltered. The main importance can accordingly be attached to the arrangement of the foundry buildings and blower houses, the transportation of raw materials becoming a matter of secondary interest.

A typical plant of this kind is that of Messrs. Gebrüder Stumm, Ltd.,* at Neukirchen, on the Saar, Rhenish Prussia, Germany, which has been installed by the inventors of this system, Messrs. Adolf Bleichert & Co. A conveniently subdivided iron hopper serves to receive the various kinds of ore and the lime stone, this hopper being provided at its bottom with valves through which the truck bodies of the suspended railway can be filled immediately. In fact, there are three sets of valves, corresponding to the three charging tracks, 1, 2, and 3 (Fig. 1), respectively. The latter are continued horizontally as far as their junction with the arranging tracks.

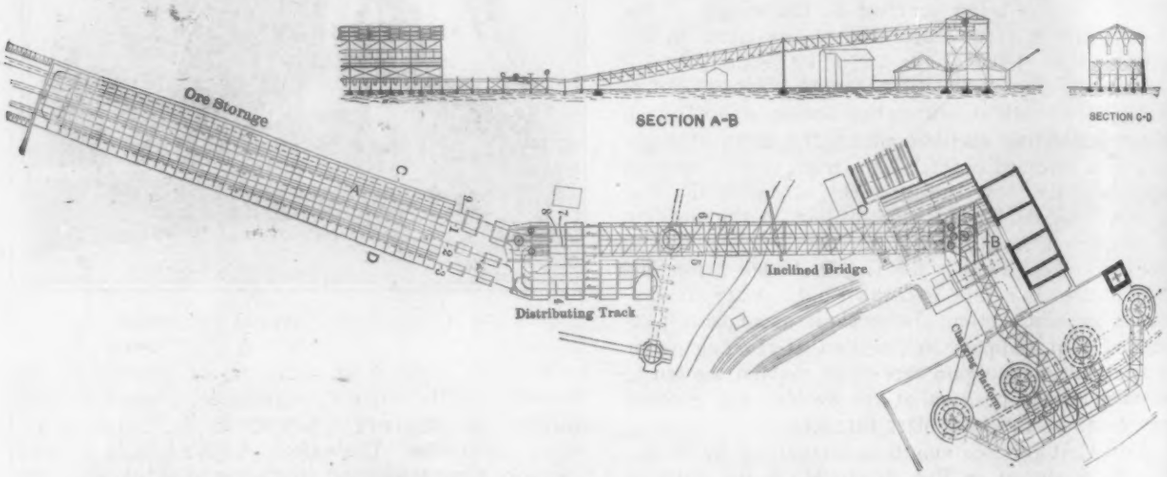


Fig. 1.—Plan of the Furnace Charging Plant Installed at the Furnace of Gebrüder Stumm, Neukirchen, Germany.

In the direction of track 4, leading toward the distributing tracks, there is fitted an automatic high-speed weighing machine for suspended railway trucks, with meter and self-recording device; at an obtuse angle to the axis of the hopper building is situated a bridge with the wire rope railway connecting the distributing tracks and the charging platform. To provide for a reserve, the railway is double tracked with two ascending and two descending tracks, thus preventing any temporary standstill. The traction cables on the inclined bridge are so arranged that each two tracks situated beside one another can be used for taking up

* Reference to this equipment was made in an article entitled "Suspension Railways in German Iron Works," printed in *The Iron Age* August 26, 1909, and some of the views therewith are interesting as supplementing the ones herewith.

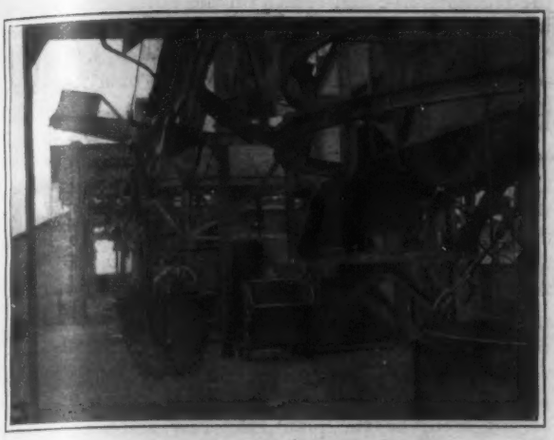


Fig. 2.—Blast Furnace Charging Platform.

the filled trucks, and the two remaining for withdrawing the empty ones.

The trucks located on the arranging track are set moving from a central switching station, situated at the end of the junction switches of the distributing track, in order then to proceed automatically toward the coupling station of the wire rope railway. The clutch used to connect the truck to the traction cable is known as the Automat clutch, patented by Messrs. Bleichert, which being actuated by the weight of the truck insures a safe attachment of the latter to the traction cable. Each of the ascending sections is provided at the lower end with a coupling device, and at the upper end with an uncoupling device, whereas each of the descending sections shows the same arrangement in a reversed order. As a truck comes running along from the distributing tracks, it enters the first or second ascending track, according to the position of the switch, and passes over the coupling station where it is held against the traction cable, while the motor at the same time is thrown out. After traversing the inclined section, the truck is uncoupled of its own accord at its upper end, while the traveling motor at the same time is again thrown in, so that the truck, according to the position of the switch, will proceed toward one of the four blast furnaces.

Each blast furnace mouth is surrounded by an annular track shown in Fig. 2, on which the truck is stopped. After being discharged by hand, it is thrown in again immediately, in order to proceed empty toward the inclined section, and after descending the latter to travel over the extreme fourth section 9 of the ore hopper building, as far as its end. The transverse distributing track, situated there is connected by switches to the three charging tracks below the hoppers, so that the man stationed there may distribute it to any one of the various sections.

As the whole plant comprises 55 trucks, which in the course of operation are either moving independently or in interconnection, or else are at rest, while the supply to the blast furnace mouth should occur with remarkable regularity, and as several kinds of ore have

Fig. 4.—Electrically Operated Car Dumper.

to be dealt with, these measures of precaution are obviously of the highest importance, preventing any collisions or excessive difference in the distances between the trucks. The safety of the plant is secured by a special arrangement, consisting of subdividing the trolley wire into different block sections, the section just traversed being disconnected from the feeders

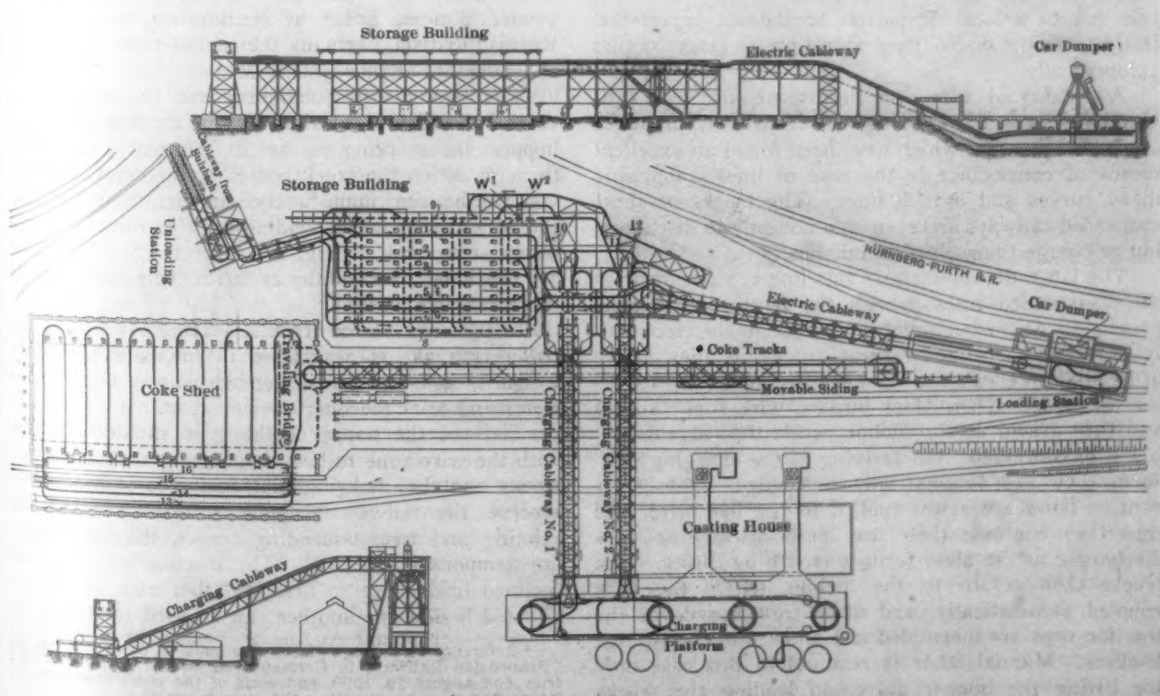


Fig. 3.—Diagram of the Plant at the Maximilian Works, Rosenberg, Austria.

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There are two distinctly different means for charging blast furnaces, one using the skip hoist and the other the wire rope railway. The former consists of raising the raw material from some point close to the blast furnaces to the furnace mouth by a hoist inclined at an angle of 55 to 70 degrees, and dumping it from an automatically discharging bucket. This process can be used only where the space immediately surrounding the furnace is unoccupied; and, moreover, it is at least desirable that elevated tanks for ores, limestone and coke should be installed in the immediate neighborhood of the furnaces, preferably parallel to the latter. Transporting material on wire rope railways, on the other hands, affords the possibility of discharging immediately into the furnace without any transfer from distant places. Several blast furnaces can be connected together by light bridges to avoid interruption of operation due to a local or partial breakdown in service. In this case the discharging operation no longer occurs automatically.

A decided advance over the use of wire rope railways was made by the design of electrically propelled suspended railways which have been found an excellent means of conveyance in the case of lines comprising many curves and branch lines. The trucks of these suspended railways are even able not only to discharge, but to charge themselves automatically.

The latest development in this line is a combination of a suspended railway with the wire rope railway principle. At the beginning of the ascent the electrically propelled suspended railway trucks, as they arrive at regular intervals, are coupled automatically to the traction cable of the blast furnace wire rope railway and thus drawn up the incline, while the current supply is discontinued. On arriving at the charging platform they are automatically uncoupled, while their contact bows are again applied to the live wire, and thus they continue their way automatically and are discharged at the blast furnace mouth by tilting. The trucks then return to the incline, where they are coupled automatically, and after traveling down the traction rope are uncoupled and proceed to the storage bunkers. Manual labor is required in this case only for lifting the hopper valves in loading the trucks and for tilting the trucks into the furnace mouth. Some men are further required for superintending the amounts of material conveyed and distributing them to the furnaces.

This system lends itself to solving the most difficult problems. It is practically independent of the original arrangement of the plant, the raw material bunkers being installed at any distance from the blast furnaces, even other buildings being situated in the intervening space. While the number of trucks required for dealing with the plant obviously increases as the distance increases, the output and wages remain strictly unaltered. The main importance can accordingly be attached to the arrangement of the foundry buildings and blower houses, the transportation of raw materials becoming a matter of secondary interest.

A typical plant of this kind is that of Messrs. Gebrüder Stumm, Ltd.,* at Neukirchen, on the Saar, Rhenish Prussia, Germany, which has been installed by the inventors of this system, Messrs. Adolf Bleichert & Co. A conveniently subdivided iron hopper serves to receive the various kinds of ore and the lime stone, this hopper being provided at its bottom with valves through which the truck bodies of the suspended railway can be filled immediately. In fact, there are three sets of valves, corresponding to the three charging tracks, 1, 2, and 3 (Fig. 1), respectively. The latter are continued horizontally as far as their junction with the arranging tracks.

In the direction of track 4, leading toward the distributing tracks, there is fitted an automatic high-speed weighing machine for suspended railway trucks, with meter and self-recording device; at an obtuse angle to the axis of the hopper building is situated a bridge with the wire rope railway connecting the distributing tracks and the charging platform. To provide for a reserve, the railway is double tracked with two ascending and two descending tracks, thus preventing any temporary standstill. The traction cables on the inclined bridge are so arranged that each two tracks situated beside one another can be used for taking up

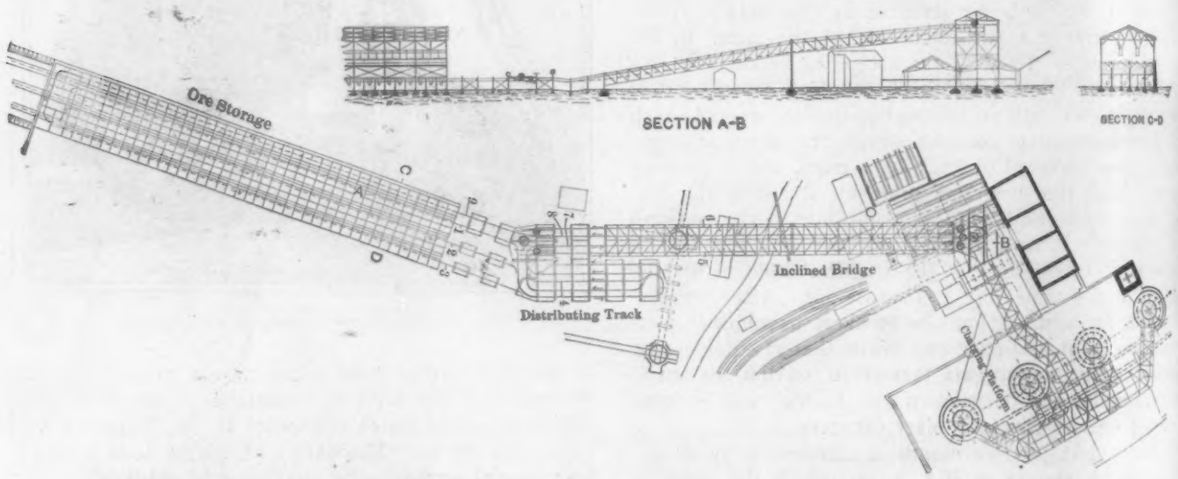


Fig. 1.—Plan of the Furnace Charging Plant Installed at the Furnace of Gebrüder Stumm, Neukirchen, Germany.

* Reference to this equipment was made in an article entitled "Suspension Railways in German Iron Works," printed in *The Iron Age* August 26, 1909, and some of the views therewith are interesting as supplementing the ones herewith.

Fig. 2.—Blast Furnace Charging Platform.

the filled trucks, and the two remaining for withdrawing the empty ones.

The trucks located on the arranging track are set moving from a central switching station, situated at the end of the junction switches of the distributing track, in order then to proceed automatically toward the coupling station of the wire rope railway. The clutch used to connect the truck to the traction cable is known as the Automat clutch, patented by Messrs. Bleichert, which being actuated by the weight of the truck insures a safe attachment of the latter to the traction cable. Each of the ascending sections is provided at the lower end with a coupling device, and at the upper end with an uncoupling device, whereas each of the descending sections shows the same arrangement in a reversed order. As a truck comes running along from the distributing tracks, it enters the first or second ascending track, according to the position of the switch, and passes over the coupling station where it is held against the traction cable, while the motor at the same time is thrown out. After traversing the inclined section, the truck is uncoupled of its own accord at its upper end, while the traveling motor at the same time is again thrown in, so that the truck, according to the position of the switch, will proceed toward one of the four blast furnaces.

Each blast furnace mouth is surrounded by an annular track shown in Fig. 2, on which the truck is stopped. After being discharged by hand, it is thrown in again immediately, in order to proceed empty toward the inclined section, and after descending the latter to travel over the extreme fourth section 9 of the ore hopper building, as far as its end. The transverse distributing track, situated there is connected by switches to the three charging tracks below the hoppers, so that the man stationed there may distribute it to any one of the various sections.

As the whole plant comprises 55 trucks, which in the course of operation are either moving independently or in interconnection, or else are at rest, while the supply to the blast furnace mouth should occur with remarkable regularity, and as several kinds of ore have

Fig. 4.—Electrically Operated Car Dumper.

to be dealt with, these measures of precaution are obviously of the highest importance, preventing any collisions or excessive difference in the distances between the trucks. The safety of the plant is secured by a special arrangement, consisting of subdividing the trolley wire into different block sections, the section just traversed being disconnected from the feeders

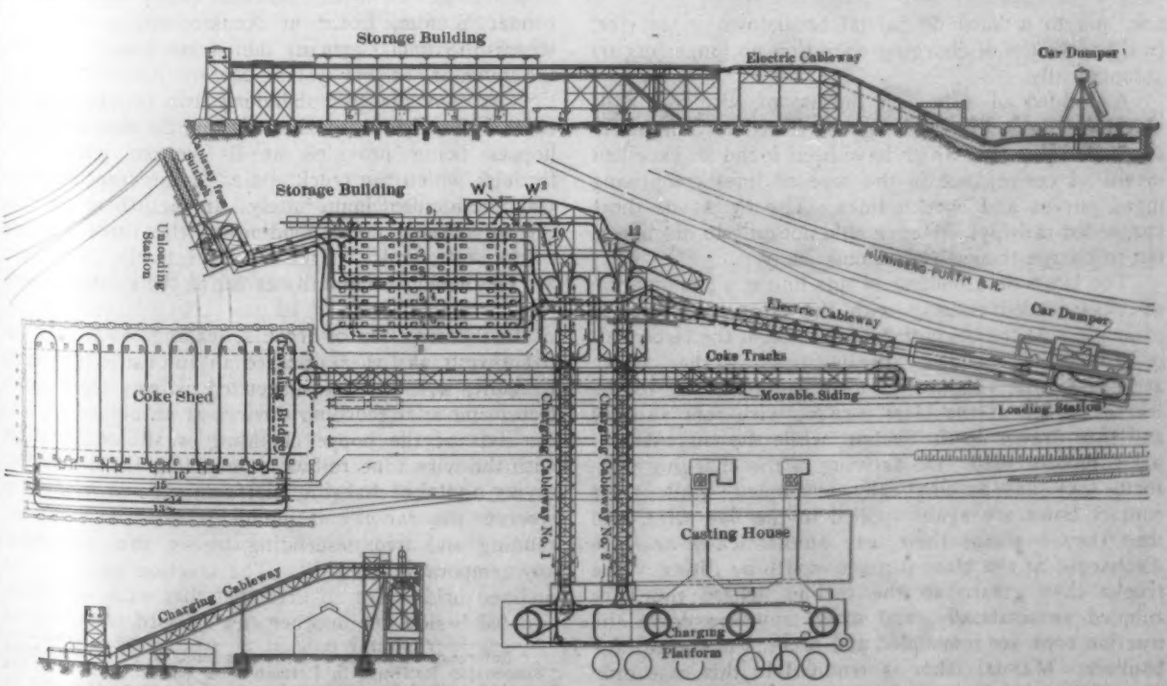


Fig. 3.—Diagram of the Plant at the Maximilian Works, Rosenberg, Austria.

through switches operated automatically by the trucks.

The switches and crossings are protected by similar safeguards, preventing any two cars traveling simultaneously over a given switch. Should the supply of trucks, for some reason or other, be increased or diminished, several trucks containing the same kind of ore will accumulate on the same section of track. When a truck, traveling on the inclined bridge, has traversed a given distance on the latter, it will throw in backward by the block arrangement, the front part of a section of the distributing track on which these trucks are located. The first of the waiting trucks then travels automatically toward the coupling station through the length of a block section, and as the remaining trucks on the arranging track advance in the same manner, the last section of this track will become unoccupied. The trucks then wait until the first truck, now stopping on the distributing track, continues its course.

Another interesting plant of the same type which, as is generally the case, at the same time serves for the transport of coke, has been installed at the Trynietz Works, at Teschen, Austria. This is especially interesting because of the very unfavorable position of the coke ovens, which, though being separated from the blast furnaces by a number of other buildings, offer no difficulty to the operation of the electrically propelled suspended railway. An open storeyard, with elevated tracks, is used, on which the ore is discharged, for the greater part, into iron chutes, while the remainder, if required, is removed by shoveling.

Another very extensive plant is that of the Maximilian Works, at Rosenberg, Upper Palatia, Austria, where all elevated tracks are dispensed with. As will be seen from the plan in Fig. 3, the incoming trucks arrive at a tilting device, Fig. 4, whose platform can be inclined to the right or left, and which is provided with two hoppers. Trucks equipped with braking chains can therefore be tilted without any change in position. The ends of both hoppers are situated in a tunnel, in which an electrically propelled wire rope railway terminates. After being filled there, the trucks are drawn up the inclined section, Fig. 5, to proceed

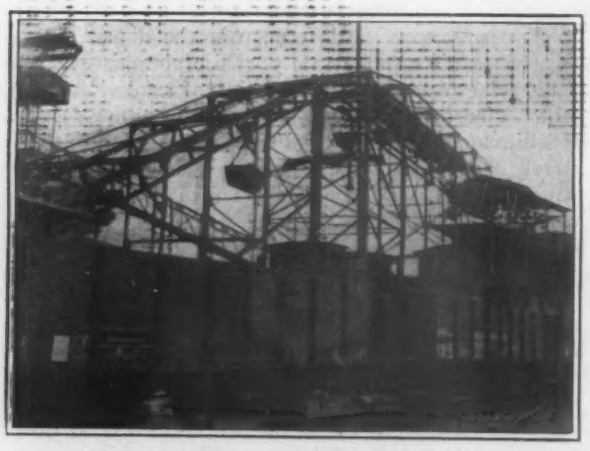


Fig. 5.—Inclined Section Between Car Dumper and Furnace Hoppers.

with electrical propulsion as far as the elevated bins. The ore trucks then deviate to the right on track 1, in order to return over track 2 to the inclined section after having been automatically discharged at some point. The trucks filled with limestone deviate to the left, traveling over the tracks 6 and 7. On the tracks 4 and 5 are dumped the raw materials coming from Sulzbach, the suspended railway trucks there being charged through a hopper served by the old wire rope railway, to which an extension has been added. Below the elevated bins are situated eight transverse suspended railway tracks (shown in dotted lines) connecting two longitudinal tracks 8 and 9, on one of which the trucks arrive and return on the other after traversing a weighing machine over track 10 or 11, toward one of the two furnace charging cableways. The reserve track 12 is intended for the case of a temporary breakdown in the car dumper.

The coke, which also arrives by rail, is stored in a covered shed. An electrically propelled suspended railway, with winch trucks, is used for charging the coke stores, Fig. 6. The filled trucks are lifted and run on the inside longitudinal track 16, and thence to one of the loops extending transversely over the coke store. After being emptied, the truck then returns to the

Fig. 6.—View of Cableway in Coke Shed.

charging tracks. Two longitudinal tracks, located near the ground, are used for removing the coke from the shed. On the two longitudinal tracks moves a bridge, equipped with rails, so as to allow the trucks to get to any point desired. The longitudinal rails are connected to the extensive rectilinear coke railway, on which the trucks get to the starting station of the charging cableway.

The two charging cableways are located on separate inclined bridges, thus dispensing with any crossings on the charging platform. The trucks are moved by a cable engaging simple forks arranged on each truck beside the clamp, worked on the incline. In fact, the adhesion of these forks is quite sufficient on horizontal sections.

The saving of hands effected by these installations is remarkable indeed. In the case of the Gebrüder Stumm 50 men can be dispensed with in each shift, and the saving at the Maximilian Works amounts to 70 hands, though three furnaces are at present in operation in place of the two formerly used.

The average power consumption at the plant first described is about 10 kw. and on the incline 12 kw., giving a total of 22 kw., which compares very favorably with the power consumption of inclined elevators. The repair cost, corresponding to the renewal of cables, is quite immaterial.

Cotton sold on the New York Cotton Exchange at 20 cents per pound August 29 caused by a corner in August options. This is the highest price realized since 1873.

Canadian Developments

Mackenzie & Mann in the Mattagami Ore Field

TORONTO, August 27, 1910.—It is reported upon what appears to be good authority that Mackenzie & Mann have taken what is called a working option on 400 acres of iron lands at Grand Rapids, on the Mattagami River. This is in the iron field that has recently come into prominence in Ontario's Hudson Bay slope. Five diamond drills are to be sent up from Toronto. Two or three miles beyond the deposits at Grand Rapids, and about that distance nearer Moose River, indications of the presence of good ore are reported. Still another field is said to have been discovered in that locality, but in a new quarter.

Mackenzie & Mann have large interests in the Atikokan iron range in the Rainy River district, and in the Atikokan Iron Company, whose furnace is at Port Arthur. They are also part proprietors of the Moose Mountain iron mine about 25 miles north of Sudbury, in the Algoma district. Of still another iron property, in the vicinity of the latter, the company has a large share. These are all on the Canadian Northern Railway, whose links are being rapidly joined in a transcontinental system, under the control of Mackenzie & Mann. In British Columbia, across which province a section of the Canadian Northern Railway is being built, the firm is likewise interested in iron properties. Not long ago Mr. Mann stated that if a blast furnace and steel plant did not soon come into existence in British Columbia through the enterprise of other parties, he would establish such works there himself. His company recently acquired the great coal properties of the Dunsmuirs. The erection of a blast furnace in Toronto was an undertaking to which Mackenzie & Mann were giving much attention a few years ago, but the financial stringency that began in 1907 rendered it necessary to drop the matter at that time. It was intended to smelt Moose Mountain ore here, the Canadian Northern branch from Sudbury having been completed to Toronto.

The Grand Rapids ore deposits are not on the Canadian Northern, though doubtless a line would be built to them from that system if it were found that they were of such magnitude and their contents were of such quality as to warrant such branch extension.

Bounty Pleas

The case for the continuance of the bounties on iron and steel is presented in a letter from Bras d'Or, recently published in a Montreal newspaper. In this the statements are made that Germany, through the kartel of wire rod manufacturers, gives a bounty of 15 marks, or $3.60, a ton on exports; that the export price is 74 marks, while the selling price in Germany is 95 marks. The Canadian duty on pig iron is, it is pointed out, only $1.50 a ton under the preferential tariff and $2.50 under the general tariff. This is exclusive of the bounty. An anti-protection correspondent takes up these statements and shows that in spite of sacrifice prices at which the kartel bounty enables the German article to be sold abroad, Canada imported no German pig iron in 1909 and only $25,000 worth of German wire. The antidumping duty would offset any disparity between the price ruling in Germany and that at which sales would be made in Canada.

Imports of Pig Iron and Castings

As Canada's imports of pig iron swell, its imports of cast iron water pipes and gas pipes do not increase commensurately with its demand for them. That demand is at the present time quite voracious, but more of it is being satisfied by domestic producers than ever before. A very considerable proportion of the enlarged tonnage of pig iron imports goes to the manufacture of these classes of pipe. In Toronto, the National Iron Works, Ltd., is doubling its capacity for the manufacture of cast iron pipe. When its extensions are completed, as it is expected they will be by the beginning of next year, they will be able to melt 100 tons of pig iron a day.

Undervaluation of Motor Cars

Customs officials at Canadian ports on the international boundary are on the alert to prevent the entering of automobiles at undervaluations. In the opinion of the collectors the practice is a very common one, and they have been exercising their wits to check it. Several months ago some seizures were made. Since then the cases may have been numerous, but they seem not to have been flagrant enough to be detected. A few days ago an automobile and motor cycle were stopped at Niagara Falls, and may be confiscated, on the ground of undervaluation for duty. The car was valued for duty at $1500, and the customs officials maintain that it is worth at least $4000.

Plans for Canadian Warships

Firms that desire to tender for the construction of the vessels to be built for the Canadian navy must send their experts to London to examine the plans. These the British Admiralty declines to intrust to parties outside the United Kingdom even for confidential inspection. Though the vessels are to be paid for by Canada, to be Canada's property, and entirely under Canada's control, the building of them must be in accordance with designs approved by the British Admiralty. The Canadian Government, having had no experience in such work, is altogether dependent on the Admiralty in the matter. As the vessels will be built by British firms or by Canadian firms allied with British, there is, after all, no hardship in the requirement that the plans be examined in London. C. A. C. J.

The Olmsted-Flint Company Will Make Belting

A new firm of belting manufacturers has entered the field in the organization of the Olmsted-Flint Company. The incorporators of the new company are Willard I. Olmsted, Stanley B. Flint and George S. Baker. It will maintain its principal sales offices at 136 Liberty street, New York, with a branch house at 1026 Arch street, Philadelphia. It is expected that branch houses will be established in the near future in Boston and Chicago.

The new belting concern, it is understood, has taken over a large leather belting factory in Philadelphia for the manufacture of its leather belting. In addition it will manufacture and sell a complete line of rubber belting, canvas stitched belting, Balata belting and solid woven belting. The Olmsted-Flint Company will also represent exclusively in the United States several European manufacturers of belting and transmission specialties.

The members of the new company are well known in the belting field. Mr. Olmsted, who heads the organization, has been in the belt business for many years, connected with several of the largest manufacturers. He is personally known to the heads of several thousands of factories, principally in New England. Mr. Flint, vice-president of the company, has traveled in connection with the belting line in all parts of the United States for several years. Mr. Baker, secretary, has for several years been editor of a belt engineering publication. Also connected with the organization is F. M. Schiffmacher, a well-known engineer in the transmission line, who will take charge of the engineering department.

Andresen-Evans Grab Buckets

A New Style Designed for Two-Line Operation

During the last two years the Andresen-Evans Company, 1501 Monadnock Building, Chicago, Ill., has been engaged in developing two styles of grab buckets, the type A for two-line operation and the type B for operation with three or more lines. These buckets are

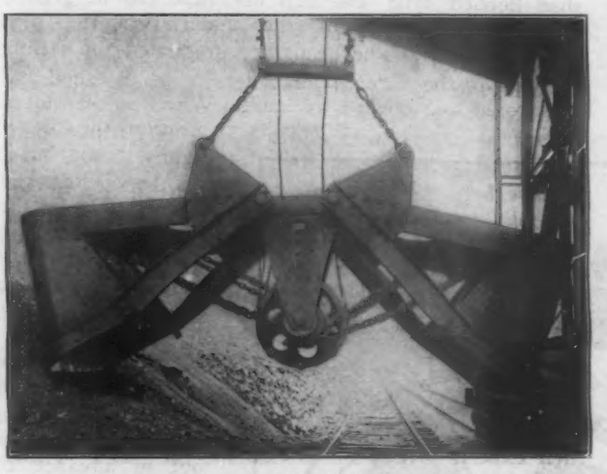


Fig. 1.—The Type A Grab Bucket Made by the Andresen-Evans Company, Chicago, Ill., Fully Opened.

new in the principle of their design and construction, and the illustrations show quite clearly the former type for handling all kinds of bulky material and especially iron ore, cement clinker and coal. Fig. 1 shows a 7½ cu. yd. bucket opened to its fullest extent for lowering into a pile of material, Fig. 2 is a view of the same bucket gathering its load from a stockpile as it closes, while Fig. 3 shows the bucket completely closed with its load ready to be hoisted by a conveyor bridge.

As will be noticed from the illustrations, this bucket has some resemblance to older types, but most of its features are different from all others. Even the differential drum which is common to this bucket and the clamshell type is not carried by an extension of the scoops as is the usual method, but is mounted in a separate centrally located frame, which also carries at its upper corners the bearings for the hinge shafts supporting the scoops. Four two-part chains are used to transmit power from the differential drum to the scoops.

Fig. 2.—The Bucket Collecting Its Load—Capacity 7½ Cu. Yd.

The designers of practically all drag buckets intended for digging heavy materials employ compound motions for obtaining a favorable cutting path at the edge of the scoop as it closes. It was necessary in order to secure this result to employ separate links and centers of rotation for the front and back corners of the scoops or an equivalent sliding motion. In this new grab the path of action of the cutting edge and inclination of the trays is obtained by the simple swinging motion of the rigidly braced scoop about separate pivots located a slight distance apart which gives a practically similar action. In closing the chains always pull in a direction approximately opposite to the line of the resistance of the cutting edge and act through a comparatively long lever arm. The combination of this feature with the multiplication of power from the differential drum and the cutting action just mentioned gives a very powerful closing action and permits very difficult material to be dug. These buckets are said to have the widest opening of any grab of equal capacity, and this with its favorable closing action insures a full load each time with a resulting maximum efficiency of the plant. The scoops are so shaped that the excess material squeezes out the back before hoisting instead of packing and preventing closing. In a test recently made in unloading a coal boat, one of these buckets took 61 per cent. more material per trip than another grab of the same rated capacity.

In a grab bucket for any purpose a long reach when

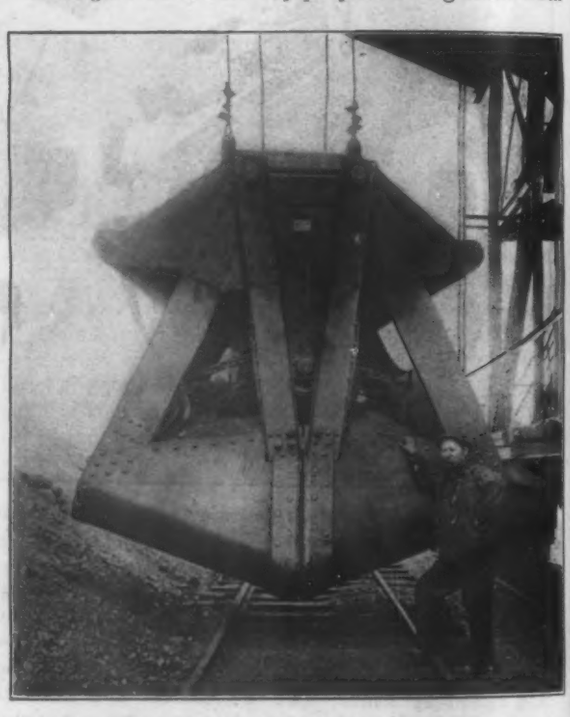


Fig. 3.—The Bucket Loaded Ready to Be Transported by the Bridge.

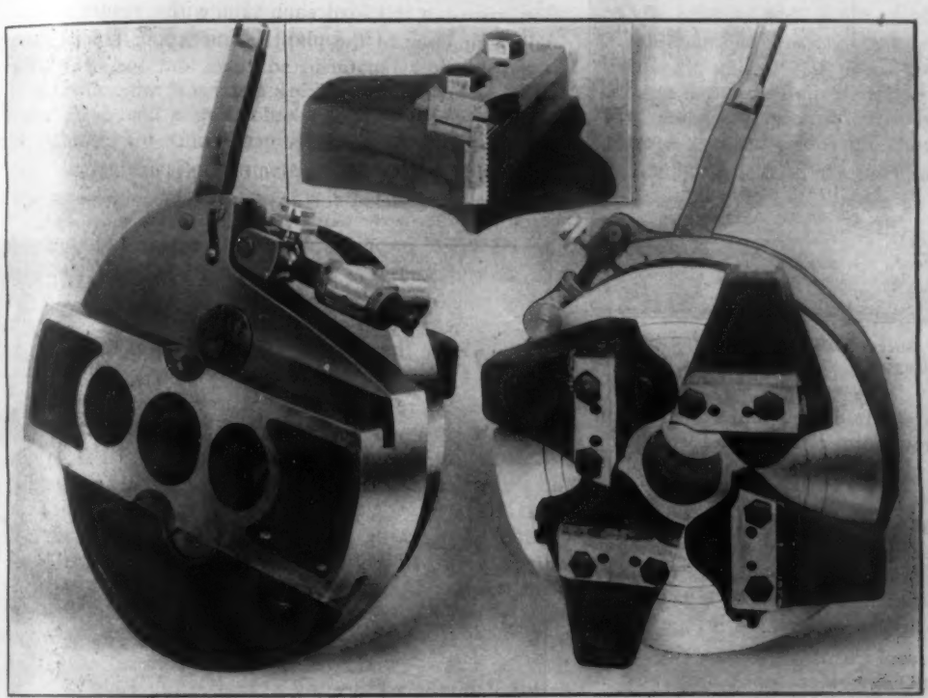
open, if obtained without making the hight too great when closed, is very desirable. This is especially true when the bucket is to be used for unloading boats since it enables a large portion of the material beneath the decks between the hatches to be removed and reduces the cleaning up by hand shoveling. In these new buckets this long reach is said to be attained to an unusual degree which is shown in Fig. 1, the distance being over 50 per cent. greater than with a clamshell bucket. This is due to the design, as when this new bucket is opened it has not only the reach of the scoops themselves, but the added effect of the distance between the hinge shafts. A grab bucket should also have small headroom over the open scoops and a low center of gravity when opened, both of which are claimed as features of this new type. The former is valuable in connection with the long reach in getting under the deck of a boat, and the latter enables the grab to fill properly without tipping over when landed on the side of a pile of material, a condition under which a large portion of its work is done.

These buckets are built in a number of different sizes ranging in capacity from 1 to 7½ cu. yds.; the

latter is the size illustrated. Each size is built in two different weights, one which is designated as the coal digging grab being intended for coal and other light materials, while the ore digging grab is used for ore and difficult excavation work. Either type can be used on two-drum hoists.

The Landis Stationary Pipe-Threading Die Head

A new type of stationary die head for pipe threading, manufactured by the Landis Machine Company, Waynesboro, Pa., which employs the maker's standard type of die with a manually operated die head, is illustrated herewith. This head is designed especially for use on pipe threading machines where the pipe revolves and the head remains stationary, the dies being opened and closed by hand. The die holders and head are made entirely of steel, and the latter can be mounted on the carriage of any of the standard pipe machines and is handled in the same manner as other styles of heads.



Front and Rear Views and Enlarged Detail of a Die Holder of the New Stationary Die Head Made by the Landis Machine Company, Waynesboro, Pa.

The heads are made in four standard sizes to take work up to and including 4 in. One of the great advantages of this die for threading pipe is that one set of dies will cut all the diameters coming within the same pitch. For example, there is but one pitch covering the sizes from 1 to 2 in., inclusive, and one set of dies covers this range, while the same is true of the other pitches. The holder which is shown in the upper part of the engraving, is used where it is not necessary to cut very close to a shoulder. The clamp holding the chaser in place is what the builder terms its mill clamp, and besides holding the chaser rigidly protects it in case the pipe splits, which frequently occurs. This clamp comes down over the shoulder of the die and is rounded out near the cutting point so as to act as a guide for the rough ends, and at the same time when a twist occurs in the pipe the strain is put largely on the clamp and thus the die is protected so that the chance of breakage is small. In threading a pipe close to a shoulder, as in the case of a short nipple, a clamp is used which comes flush with the front edge of the chaser only, thus permitting the die to run up close against the shoulder.

The chaser for these die heads is made from high speed steel, which eliminates necessity for annealing, rehobbing or retempering, and the life is said to be many times that of any other die. The die is easily sharpened by grinding the ends of the chasers and again setting them to the correct cutting position in the holders, which is indicated by a small gauge furnished with each head.

Advantages claimed for this die are it can be used at cutting speeds of 25 to 100 per cent. higher than hobbed type and that the rake can be ground to suit the quality of the material in the pipe to be threaded. The heads are graduated for setting the dies to the different diameters to be threaded and are closed and opened by hand. When in the closed position the die is rigidly locked, but it can be opened and closed freely by the lever projecting from the top. Another advantage claimed is long life of the dies.

All dies are made to interchange, and if one chaser of a set should be worn out in advance of the others it can be replaced without purchasing an entire set. Dies of any one pitch will interchange on any of the die heads so long as the pitch is within the range of the head. For example, dies for threading a 1-in. pipe on a 1-in. head will thread the same diameter pipe on a 2-in. head, or vice versa, thus avoiding the necessity of carrying a large assortment of dies to cover a wide range of work when using a number of these heads.

James Watson & Co., Glasgow, Scotland, in their circular dated August 19, say: "Owing to the continued strike of miners at Bilbao, hematite prices are distinctly firmer, warrants and makers' iron having appreciated 1 shilling to 1 shilling 6 pence per ton on the week. We have to report a fairly active market for Cleveland warrants, with a hardening tendency, although on realizations the close is 1½ pence per ton under the best price of the week. There have again been evidences of more outside interest taken in the market, and consumers continue to buy to cover their requirements well forward. With an active home trade, and more Continental buying, the pessimistic sentiments which have been predominant here for some months are gradually disappearing."

Papers of incorporation have been filed by the Alaga Mining, Power & Development Company, which has taken over 6000 acres of brown ore lands in Cherokee County, Alabama. Y. A. Dyer is president and secretary of the corporation, with E. F. Enslen treasurer, both of whom are of Birmingham, Ala. Washers have been installed and steam shovels are ready for operation. It is intended to commence operations with an output of 3000 to 5000 tons of ore per month.

A New Single Stroke Open Die Header

The E. J. Manville Machine Company's New Type Containing Several Improvements

An improved type of single stroke open die header is shown in the illustrations, as designed and built by the E. J. Manville Machine Company, Waterbury, Conn. It is intended for heading long rivets and wood screw blanks, tire bolts, &c., which are subsequently shaved to remove the surplus stock and the fin under the head caused by the joint in the gripping or heading dies, and for cutting and heading rapidly wire where the fin marks are not detrimental. The machine is built in six sizes, ranging from the No. 00, shown in Fig. 1, for work up to ⅛ in. in diameter and 1½ in. long, to the No. 4, illustrated in Fig. 2, which will manufacture headed blanks up to ⅝ in. in diameter and 7 in. long, where the heads are of such proportions as to make desirable the single stroke design.

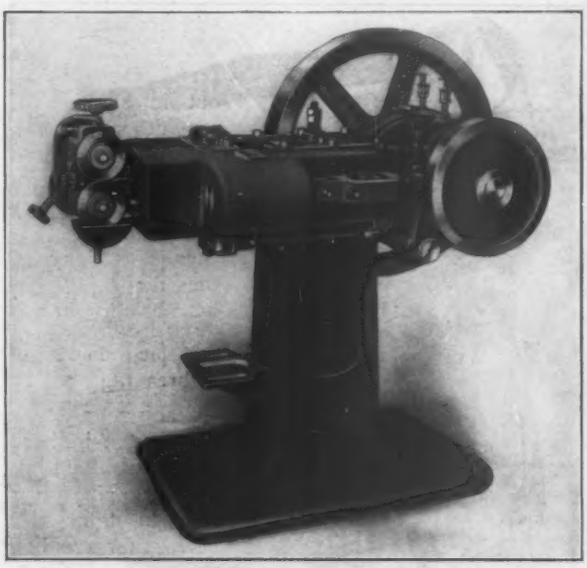


Fig. 1.—The No. 00 Pedestal Base Type Open Die Header.

This type lends itself to greater speed than the solid die, because feeding the wire between the dies ejects the finished piece without loss of time, and because the blank is moved quickly through to bring it in line with the heading punch. The open die type machine is particularly adaptable for work of greater length than 8 or 10 times the diameter.

A feature of the new design is the carrying of the dies in a steel lined pocket formed in the frame, from which they may be removed quickly. They are supported by and slide on a hardened tool steel plate, and are backed by a similar plate which takes the shock or thrust of the heading punch. A sliding cover plate bears on their upper surface and can be moved on a track toward the gate, exposing the dies for quick changes. The construction of the die holder permits casting in the bed a heavy tie extending from side to side just below the dies and close to the line of pressure. It also allows applying a rigid mechanical wire stop against which the end of the wire is pressed by the feed rolls just as it is being cut off, as in a solid die header, thus insuring uniform length of blanks. Another resulting feature is a fine adjustment for length, which may be made while the machine is in motion.

The toggle gripping mechanism consists of hardened tool steel parts and is operated by a positive acting cam of tool steel on the end of the crankshaft. The toggles are contained within a heavy bracket or box cast solidly on the side of the frame. The construction is such as to greatly reduce the fins on the blanks. The three smaller sizes are constructed with a single toggle link, while the three large machines have a powerful compound toggle with a double set of links, thus distributing the strains over a large area. The company's breaking plate has been introduced into the type to minimize the chance of breaking the machine in case the wire is caught between the dies. The machine frame is of large cross section, while the crankshaft is of hammered heat treated nickel-steel and runs in bushings which support it close to the crank pin. The gate has a large bearing surface, carefully scraped to fit the frame, and the connection at the crank end is bronze lined. Careful study has been given to the matter of lubrication, sight feeds being employed, while the wire is automatically oiled as it enters the machine.

The capacities of the several sizes and the principal dimensions are as follows:

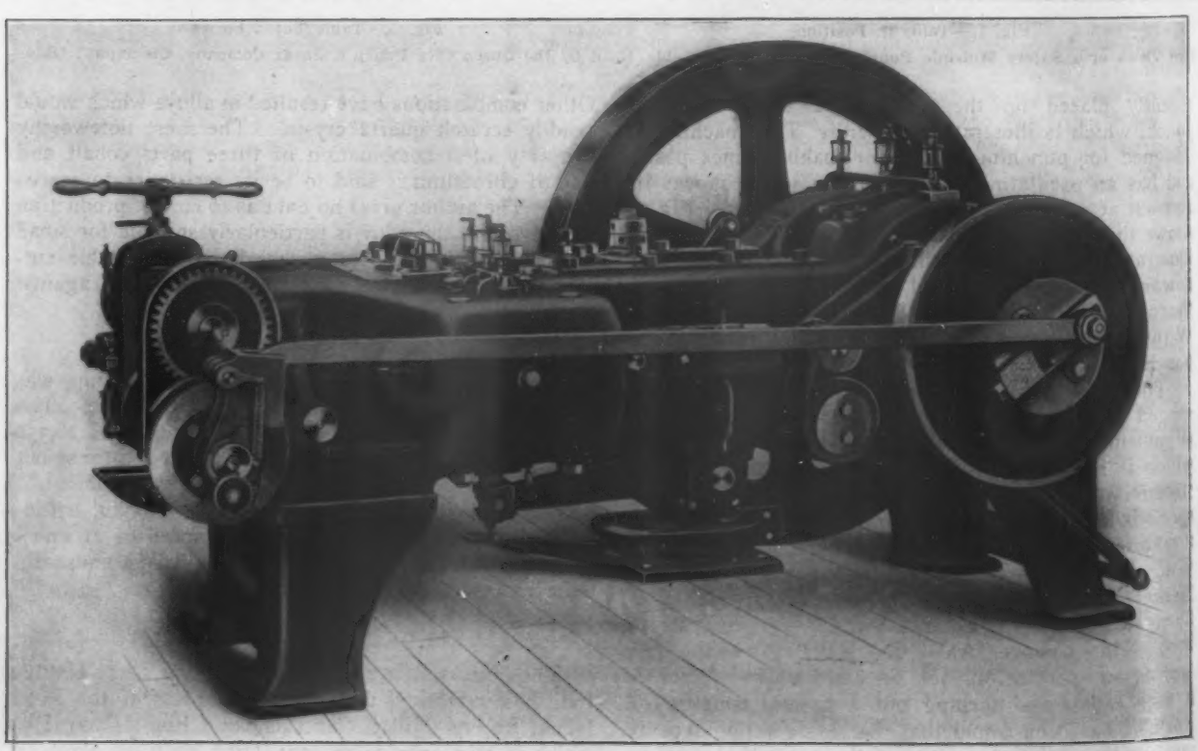


Fig. 2.—The No. 4 Open Die Rivet Machine Built by the E. J. Manville Machine Company, Waterbury, Conn.

Machine No.	00	0	1	2	3	4
Diam. of wire, in..	⅛	5/16	¼	5/16	⅜	⅝
Length of rivet, in.	1½	2	2½	3½	6	7
Size of dies, in....	13/16	17/16	17/16	111/16	1⅝	2⅝
Diam. of punch, in..	½	⅞	1	17/16	1⅞	2½
Stroke of gate, in..	2¼	2¾	3½	5	7	8
Diam. of feed rolls, in.	4½	5	6	7	9	10
Diam. of wheel, in.	26	30	42	51	60	60
Face of wheel, in..	3½	4¼	5	5½	6	8
Weight of wheel, lb.	154	275	365	675	1,080	2,500
Rivets per minute..	250	200	150	100	80	60
Net weight, lb.....1,200	2,000	3,200	5,300	9,300	19,000	
Floor space, ft...2¼x3¼	2½x4¾	3¼x5¾	4x7	4¾x8	6⅜x10	

The two smaller sizes are mounted on a heavy pedestal with large base, a design which makes it convenient to get at the tools, and permits the work to drop into a receptacle placed on a shelf at the front of the pedestal.

The New Queen City Safety Multiple Punch

With a view to eliminating the possibility of accidents to the operators which frequently occur in working presses and punches of the ordinary type, the Queen City Punch & Shear Company, Cincinnati, Ohio, has recently placed on the market the safety multiple punch, which is illustrated herewith. This machine is designed for punching angles for making fence posts, and has an oscillating table or platen which moves in and out at each stroke of the plunger or ram. Fig. 1 shows the table in its customary position, while Fig. 2 illustrates the forward or tilted position. It is said that it would be a case of willful negligence on the part of the operator or feeder for his hands to be injured. With this punch it is claimed that two bars can be punched at the same time in one stroke.

The machine is very substantially built, and arranged so that the punches and dies cannot get out of alignment. It is provided with a safety stop clutch, which is released or locked instantly by the operator. In this way the machine runs continuously, and the speed is regulated by the character of the work and the ability of the operator to handle it rapidly. This punch is somewhat similar to the punch placed on the market by this company some time ago, which was illustrated and described in *The Iron Age* August 19, 1909. This, however, was a double acting machine, requiring an operator on each side, and while, of course, it was capable of turning out a greater amount of work, it has been found that the single acting type is much more satisfactory, especially where heavy bars are handled.

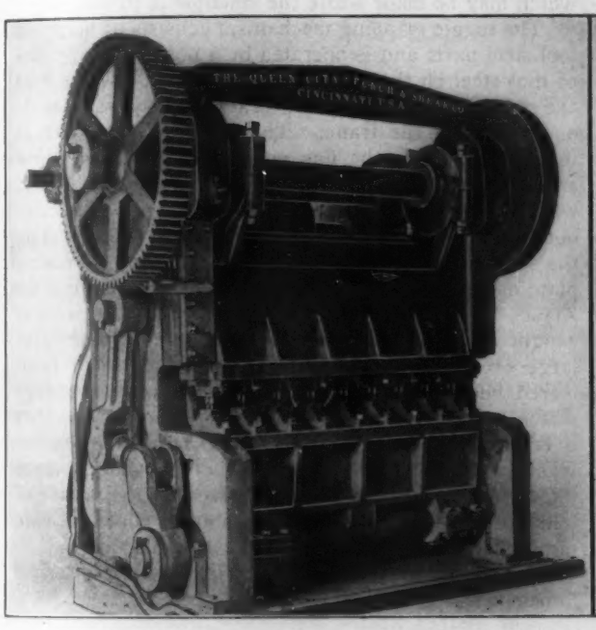


Fig. 1.—Table in Position.

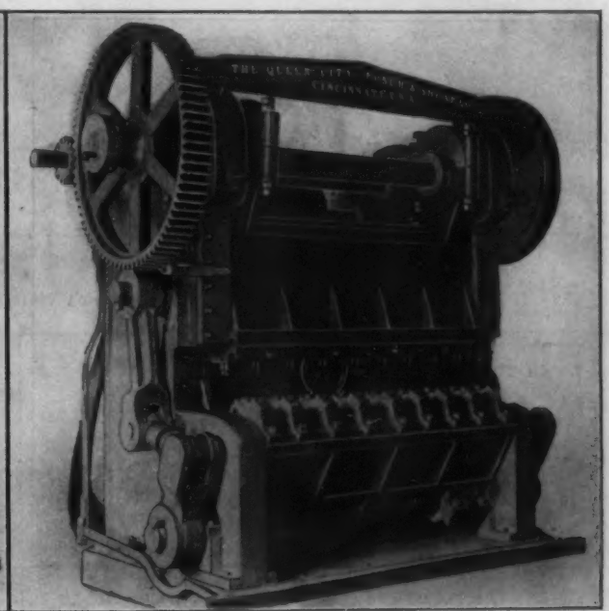


Fig. 2.—Table Tilted Forward.

Two Views of a Safety Multiple Punch with Oscillating Table, Built by the Queen City Punch & Shear Company, Cincinnati, Ohio.

A Cobalt-Chromium Alloy

A paper was read by Elwood Haynes, president of the Haynes Automobile Company, Kokomo, Ind., before the American Chemical Association at San Francisco, July 16, entitled, "The Production of Alloys of Nickel and Cobalt with Chromium." The author tells of his first experiments in 1895 in the production of alloys of nickel with iron, chromium and other metals. In 1905 he repeated some of these, with a view to utilizing the alloys of cobalt and nickel with chromium for ignition points in gas engines. The final outcome was the production of an alloy containing 75 per cent. cobalt and 25 per cent. chromium which by proper treatment could be hammered into thin sheets at a bright red heat without signs of cracking. The material had an elastic limit of 79,000 lb., tensile strength of 96,000 lb. and an elongation of 3 per cent. A pocket knife blade and several table knife blades were made from it and were found satisfactory. By reducing the quantity of chromium and adding other metals, alloys have been produced, the author says, which are proof against nitric acid and sufficiently malleable to be worked cold. Other combinations have resulted in alloys which would readily scratch quartz crystal. The most noteworthy property of a combination of three parts cobalt and one of chromium is said to be its resistance to corrosion. The author gives no data as to cost of production but says that the alloy is particularly suitable for small cutting instruments, for pocket knives and table cutlery, since it holds its edge well and is proof against tarnishing.

The Orion, Great Britain's greatest battleship, was launched at Portsmouth, England, August 20. The armored cruiser Lion, recently launched, is of 26,350 tons, and the Orion will displace only 22,500 tons; but her ten 13.5-in. guns and her new, deadly equipment of torpedoes render her by far the most powerful battleship afloat. The Orion will have a speed of 21 knots and will carry 4000 tons of fuel, giving her an unusually wide radius of action.

The Highland Iron & Steel Company, Terre Haute, Ind., has purchased the rolling mill plant of the Blue Island Rolling Mill & Car Company, Blue Island, Ill., which it will operate in connection with its plant at Terre Haute.

Pridmore Molding Machine Roll-Over Attachments

The accompanying illustrations show the Pridmore heavy double shaft stripping plate machines, both the round and square types, built to be operated as roll-overs, with the service of a crane or hoist. Figs. 1, 2 and 3 illustrate the 36-in. round machine, fitted with a mower wheel pattern; Figs. 4 and 5 show a large square machine fitted with a 52-in. threshing machine gear.

Fig. 1.—The Bare Machine.

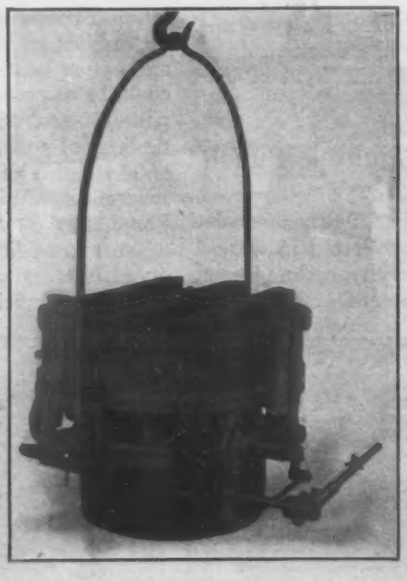


Fig. 2.—The Flask Rammed.

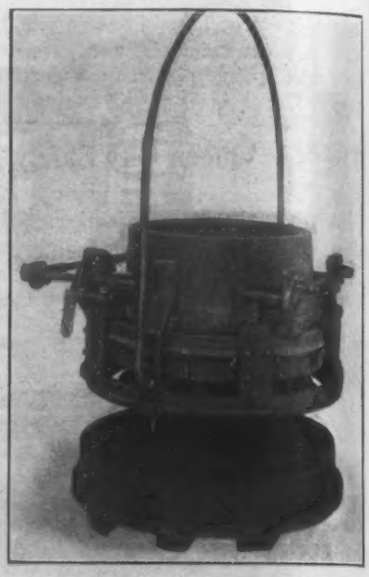


Fig. 3.—Rolled Over and Drawn.

A Round Heavy Double Shaft Stripping Plate Machine Built by Henry E. Pridmore, Chicago.

Fig. 4.—A Square Pridmore Heavy Double Shaft Stripping Plate Machine with the Pattern Up.

Fig. 5.—The Same Machine with the Pattern Drawn Down.

The attachments necessary to effect this method of operation are the trunnions to which the hoist bale is attached and the special turnover handle. The operation of making a mold on a machine of this design consists of setting on the flask and ramming it up, clamping it with the bottom board to the machine, adjusting the crane, turning the entire equipment over and setting it down on the floor, then drawing the pattern upward away from the mold, lifting the machine off and returning it to the floor ready for the next mold to be made. One of the advantages to be derived from this method of operating a stripping plate machine is that the necessity of baring the drag flask is obviated. The cope, of course, can be made on the same machine, but the turnover features are not utilized.

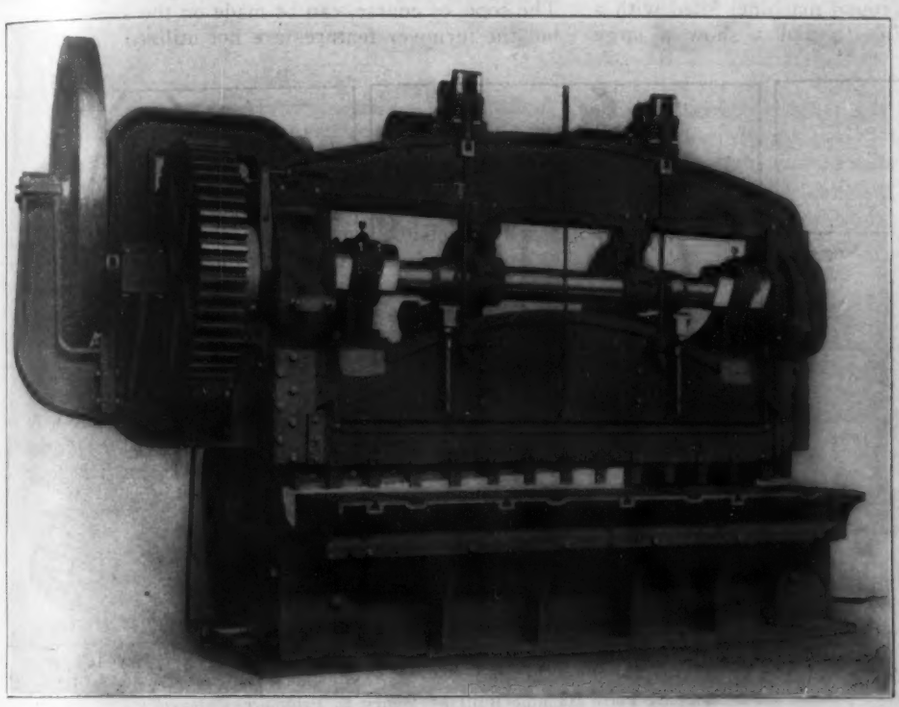
Turnover attachments can be applied to any of the numerous sizes in which these double shaft machines are built; the nature of the work to be molded determines whether such a principle of operation is desirable. Patterns such as gears, &c., having deep pockets are handled to great advantage on machines of this design. These machines are made by the firm of Henry E. Pridmore, Chicago, Ill.

The United States Radiator Corporation's Chicago Branch.—The United States Radiator Corporation is busily engaged redecorating and fixing up its commodious quarters at 34 Dearborn street and 99 Lake street, Chicago, and expects to have a full line of its products on the floor for display purposes in the course of a couple of weeks. From 250,000 to 500,000 ft. of radiation and from 300 to 400 boilers of various sizes will be carried in stock in a warehouse located at Kingsbury and Indiana streets, from which all business in the Chicago territory will be taken care of. Facilities for making shipments from this warehouse are exceptionally good, as it has lighterage service on the river and connection with the system of the Illinois Tunnel Company which reaches all railroad terminals. A railroad siding has just been completed.

The Algoma Steel Company, subsidiary of the Lake Superior Corporation, is rapidly completing its merchant steel plant. This plant, which occupies a building 720 ft. long, consists of two mills, one 12 in. and one 18 in. Electric power will be supplied to these mills by a gas engine plant, now nearing completion, comprising eight 2200-hp. Allis-Chalmers engines, four of which will be used as blowing engines and the others for general power purposes. The 12-in. mill will have a 900-hp. motor and the 18-in. mill a 1500-hp. motor. Half of the new by-product coke plant will be in operation before the close of this year.

A Large Long & Allstatter Gate Shear

The Pullman Car Company has recently purchased from the Long & Allstatter Company, Hamilton, Ohio, the very large gate shear which is illustrated herewith. While there are no new features involved in its construction, the shear is nevertheless interesting on account of its size. This machine is intended for shearing plates, and the heaviest one that can be cut at one stroke of the slide is 12 ft. long and 1 in. thick. The shear is entirely self-contained and carries the motor which furnishes the power for operating it.



A Gate Shear for Cutting Plates 12 Ft. Wide and 1 In. Thick, Built by the Long & Allstatter Company, Hamilton, Ohio.

One especially interesting feature is that the end of the cam shaft and all the countershafts are so supported as to leave the floor around the machine free from obstructions. The shear has an automatic clamping device which holds the material while it is being cut and releases it as soon as the cut is made.

When assembled the weight was over 130,000 lb., although the floor space occupied, 10 x 20 ft., was much less than that required by some shears of a much smaller capacity. The stroke of the shear is 8 in., the ratio of the gearing is 14 to 1 and the flywheel is 82 in. in diameter.

The Swartwout Rotary Ball Bearing Ventilator

The need of providing pure air for operatives in various lines of mechanical work has been pretty well settled; the question now is how to get adequate ventilation at the least cost. In many factories the ventilation is inadequate, generally because the apparatus considered is costly and involves a continual operating expense. While expensive apparatus is desirable for some types of buildings, this prohibitive first cost and continual maintenance expense is frequently unnecessary, as an outlet in a room to permit the heated air to escape is often all that is required. It needs, however, an effective ventilator, and the Ohio Blower Company, Cleveland, Ohio, claims to have such in the new Swartwout rotary ball bearing ventilator illustrated herewith.

This ventilator is said to embody features that make it effective at no expense other than the first cost. In the circular rim bound type of ventilator the air is required to make two right angle changes of direction, while in the Swartwout it escapes with a single turn and through ample openings. As compared with the other type this ventilator swings with every change in the direction of the wind, and when air moves across the top of the ventilator the entire area of the opening is effective in allowing the air which has been induced to flow upward to escape. In the circular type it is said that a much smaller portion delivers air.

The main part of it is suspended on a tripod which revolves on ball bearings. The four louvres are constructed so as to close by gravity, thus rendering the entire ventilator dust and storm proof. The opening of the louvres is accomplished by pulling a chain from the inside of the building, and all four open simultaneously as they are hinged to the same rod. If desired the metal top of the ventilator can be replaced by glass, and the joints made waterproof by the application of cement. When this is done the ventilator acts as a combined ventilator and skylight, and closing the openings does not shut out the light, as the louvres are at one side of the glass top.

This ventilator is made of Toncan metal, which is rust resisting, and especially adapted for exposed sheet metal work. Its use was adopted to overcome the difficulties encountered in the use of ordinary forms of charcoal iron, galvanized steel and similar materials, and tests made have proved this new metal to be much more durable than the materials generally employed in the construction of ventilators.

The Swartwout Rotary Ball Bearing Ventilator, Made by the Ohio Blower Company, Cleveland, Ohio.

The Rowbottom Ball Bearing Disk Grinder

The disk grinding machine shown in Fig. 1 has been added to the line of the Rowbottom Machine Company, Waterville, Conn. It is built in three sizes, having disks of 12, 18 and 24 in. in diameter respectively. A departure from the standard practice in machines of the class is mounting the spindle in ball bearings, as shown in Fig. 2, the Hess-Bright type having been selected for the purpose. At the right end of the machine is a sliding table having two T slots for fastening angle plates or fixtures. The table is controlled by a hand lever, and an adjustable stop screw limits the inward motion to insure a uniform thickness of the finished product. The table has an angular adjustment to

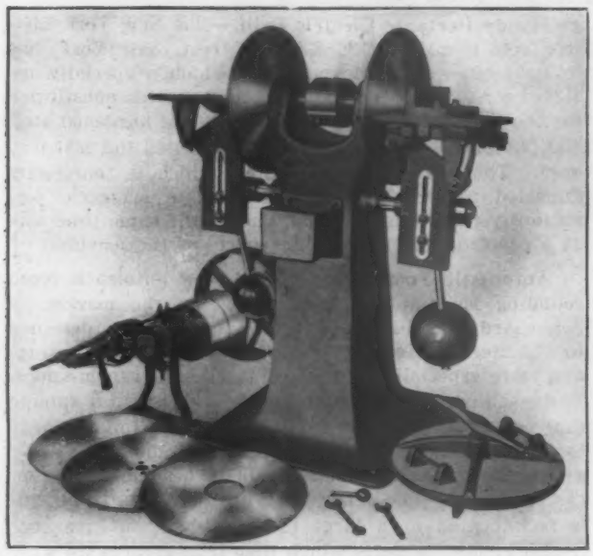


Fig. 1.—A New Ball Bearing Disk Grinder Built by the Rowbottom Machine Company, Waterville, Conn.

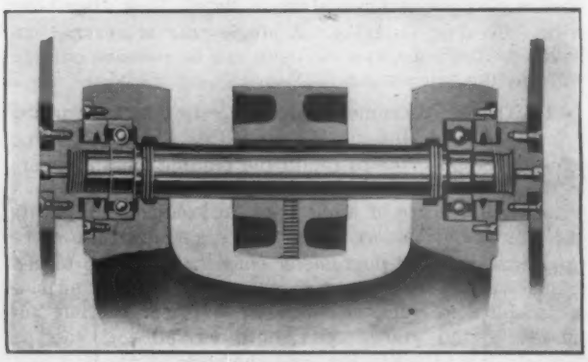


Fig. 2.—Section Through the Spindle, Showing Details of the Bearings.

the face of the disk, and the whole is balanced for a swinging motion across the face.

At the left end is a plain table with a lip on the front edge, which is square with the face of the disk, for convenience in grinding the ends of pieces square with the edges. This table also has the angular adjustment and the swinging motion. Either table may be fastened in a fixed position, and each is adjustable in a vertical direction to permit the greatest surface to be presented to the most effective cutting part of the disk. A water pot is attached to the machine for cooling pieces where heavy grinding is to be done.

The sectional view, Fig. 2, shows the construction of the spindle bearings. The ball bearings are connected with grease cups, which insures a supply of lubricant without attention over long periods.

Another Merchant Mill at the Lackawanna Steel Works.—The directors of the Lackawanna Steel Company, at their regular meeting, August 25, authorized the expenditure of about $800,000 for the immediate construction of an additional merchant mill at Buffalo. This is in keeping with the board's policy of further diversification of Lackawanna Steel Company's products, and will enable the company to distribute more of its steel among consumers in its natural territory. It is expected that the new mill will be ready for operation about July 1, 1911.

The Spartan Chain Pipe Wrench

The slant of the teeth on the jaws of the Spartan chain pipe wrench, made by the Drop Forging Company of New York, West Side avenue and Fisk streets, Jersey City, N. J., is the principal feature on which are based the claims for its excellent satisfaction in use. Otherwise it is constructed on the same general lines as the standard approved patterns of chain wrenches.

The slant of the teeth is plainly shown in Fig. 1 herewith, from which it will also be noticed that the inclination is opposite on the two parts of the jaws and that both are in directions which, when the wrench is used, tend to force the jaws against the handle instead of spreading them, reducing the strain on the bolt heads. The main purpose of the slant of the teeth is to give

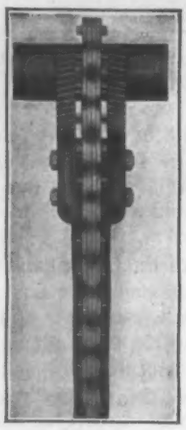


Fig. 1.

Fig. 2.

The Spartan Chain Pipe Wrench Made by the Drop Forging Company of New York.

an immediate bite on the pipe, even when the teeth have become worn. It gives directly the effect that is sought with a straight toothed pipe wrench when the user cramps or twists it so that the biting edge of the teeth is at an angle with the pipe, to secure a grip.

The two-bolt connection of the jaws to the handle, shown in Fig. 2, gives additional security to the jaws, besides permitting the use of the lower bolt for temporary repairs in the field if the upper bolt should break and another not be procurable. The Spartan wrench is drop forged throughout, even the handle. The chains are hand made, of a special steel of very high tensile strength, and the jaws are hardened and tempered to insure long life of the teeth. Six sizes of wrench are made, covering a range of pipe sizes from ⅛ to 12 in.

The Lynchburg Foundry Company, Lynchburg, Va., which has increased its capital stock from $500,000 to $600,000, is preparing plans for an addition to its works to be 35 x 160 ft., three stories, fireproof construction. No machinery is to be bought for this addition, as the company's equipment is already sufficient. The new building will not be contracted for, but the work will be done by the company by day labor. This company owns and operates the McWane Pipe Works and Radford Pipe Works, manufacturing cast iron pipe, and the Lynchburg Plow Works, manufacturing chilled and cast plows.

The Jefferson Swing Union

The Jefferson Union Company, Lexington, Mass., is making a new swing union, which consists of two 45-degree elbows with a spherical iron-to-iron seat ground to a perfect fit, the two ends being connected by a nut of either brass or malleable iron. These unions can be furnished at a slight extra cost with the Jefferson brass-to-iron seat, consisting of a narrow brass ring sunk in a channel and fitting it tightly. A lip of iron keeps the brass ring from coming in contact with the fluid, and also protects it from injury if the pipe is screwed in too far. A description of this seat appeared in *The Iron Age*, April 28, 1910, in connection with an illustration of the new style F union of this company. Where space is limited the swing union can be furnished with a special notched nut that can be set up with a bar of iron and a hammer instead of a wrench.

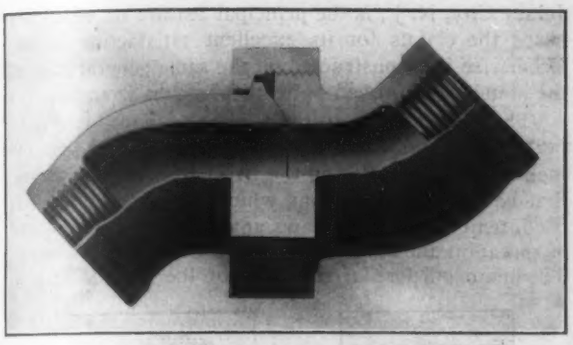


Fig. 1.—The New Swing Union Made by the Jefferson Union Company, Lexington, Mass.

Fig. 1 shows the construction of this union, and Fig. 2 typical different angles at which the two parts may be made up to connect pipes. These vary from slightly offset parallel pipes to two pipes in the same plane at a right angle. It is possible in the intermediate positions to make connections between pipes at a great variety of angles and the joint is said to be always tight, regardless of the angle of connection, because of the spherical seat. Combining one end of the swing union with the regular fittings makes it almost a universal union, as it is then applicable to many kinds of odd connections and accomplishes the same results, it is claimed, with several less parts and in a shorter time than is possible by any other means.

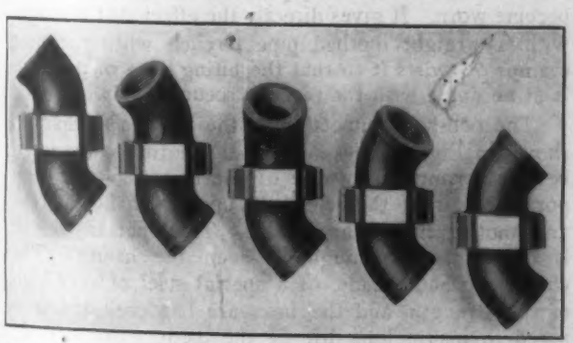


Fig. 2.—Different Positions in Which the Jefferson Swing Union Can Be Used.

These unions are especially applicable to the awkward lines followed by piping around stationary and marine gas engines, automobile engines, &c. With an iron-to-iron seat, these unions can withstand the high temperature of the exhaust from gas or gasolene engines, while the internal form, as shown in Fig. 1, is in such easy lines as to obviate back pressure. By using the Jefferson style F union and a notched nut, connections can be made in a very short time. The materials used in the manufacture of these unions are selected with special reference to their resistance to corrosion when being used in the neighborhood of salt water.

New Tools and Appliances

High Power Vertical Millers.—The Becker Milling Machine Company, Hyde Park, Mass., is building a line of new model high power vertical milling machines. In developing these machines the builder has strived to secure the highest possible efficiency, using the belt driven spindle, while for the heavier cuts recourse is had to the direct-connected back geared spindle. The machines are equipped with a constant speed driving pulley, and the changes in spindle speeds and feeds are secured through gear boxes.

Handy Portable Electric Drill.—The New York Electric Tool Company, 136 Liberty street, New York, has brought out a portable model in which a specially designed street railroad type of motor has been substituted for the light fan type generally used, and hardened steel and phosphor bronze gears have supplanted the cast iron ones. The body is made of steel which is thoroughly annealed to offer the highest possible magnetic permeability for the motor field, and at the same time acts as a protector for the working parts of the machine.

Automatic Tooth Rounder.—A new automatic tooth rounding machine has been placed on the market by Schuchardt & Shutte, New York City, which is designed to chamfer the teeth of gears for all classes of work, and more especially those used in sliding transmissions. The machine uses a profiling cutter carried in a spindle that can be swiveled to angles best suited for any gear tooth. Motion is transmitted to the spindle carriage by a box cam, which moves the spindle head crosswise on the cross rail. The arbor, carrying the gears to be cut, is reciprocated by a large indexing gear, in turn controlled by change gears which time it in accordance with the number of teeth in the gear that is being operated on. This motion is entirely automatic, and the operation is continuous from start to finish, thus dispensing with individual indexing. A single gear or several can be handled at once, and the teeth can be rounded on both sides at the one setting.

Universal Micrometer Caliper.—In the new model brought out by Gilbert, Harris & Co., Chicago, Ill., no effort has been made to retain the reading measurements of the ordinary micrometer, but simply to produce a tool with a wide range of application in producing duplicate parts or fits of various kinds where a known allowance can be made. The micrometer consists of a drop forged frame with a sliding rod in one end for quick adjustment and a micrometer screw in the other for fine adjustments and allowances. Both adjustments can be securely locked when set, and the ends of the rod and the screw are convex, so that it can be used on running work in a lathe the same as an ordinary pair of calipers or as an inside caliper.

Furniture for Machine Shops.—The Western Tool & Mfg. Company, Springfield, Ohio, has brought out several new pieces of furniture for use in machine shops. One of these is a toolmakers' vise stand, which is ordinarily used in the customary position, but if desired to hold work in unusual positions a side attachment is clamped in the hole of the column and the supporting stem of the vise held at any desired angle. Other pieces include a compact rack for holding 12 different sizes or kinds of steel and two forms of shop stands. One of these is designed to be used in connection with lathes, and the lower shelf is arranged to provide a convenient place for change gears and dogs, while two shelves are provided for holding the work, and there is a drawer for small tools or gauges. The other stand is of the portable type and can be conveniently moved to any part of the shop. It is frequently used for holding work after it is operated on by one machine and the whole stand is then moved to the next machine for further operations.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.90¢
1½ to 4 in. x ¼ to 5-16	₩ lb 2.10¢
Rods—¾ and 11-16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 3-16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ⅛ in.	2.20¢
1½ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.55¢
½ x 3-32 in.	4.35¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.30¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ lb, 3.20¢
Nos. 22 to 24	₩ lb, 3.55¢
No. 26	₩ lb, 3.75¢
No. 28	₩ lb, 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.15¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.90
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 36 @36½¢

Copper—

Lake Ingot	₩ lb 14½@15 ¢
Electrolytic	₩ lb 14½@14¾¢
Casting	₩ lb 14¼@14½¢

Spelter—

Western ₩ lb 6½@6¾¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8½¢

Lead.

American Pig	₩ lb 5 @5¼¢
Bar	₩ lb 6½@6¾¢

Solder.

½ & ½, guaranteed	₩ lb 22 @22½¢
No. 1	¢ lb 19 @19½¢
Refined	₩ lb 17½@17¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb. @10¢
Hallett's	@9¢
Other Brands	@8½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting	32¢
Rods & Wire	Base Price 32¢
Sheets	Base Price 32¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy cut and crucible	₩ lb 10.75@11.
Copper, Heavy and Wire	₩ lb 10.50@10.
Copper, Light and Bottoms	₩ lb 9.50@9.7
Brass, Heavy	₩ lb 7.25@7.5
Brass, Light	₩ lb 5.75@6.0
Heavy Mechine Composition	₩ lb 9.50@9.1
Clean Brass Turnings	₩ lb 7.00@7.2
Composition Turnings	₩ lb 8.25@8.5
Lead, Heavy	₩ lb .....@3.5
Lead, Tea	₩ lb .....@3.7
Zinc Scrap	₩ lb .....@3.1

ALL THERE IS TO SAY ON A FILE!

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